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PERCEPTION OF TEACHERS ON HACK MINDSET METHOD FOR TEACHING OF CONTEMPORARY ENVIRONMENTAL ISSUES IN GEOGRAPHY OF YAOUNDE VI MUNICIPALITY-CAMEROON.

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Award of a Master's Degree in the Didactics of Discipline with specialization in Didactics of Geography.

Option: *Research*

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ACADEMIC YEAR 2023

CERTIFICATION

This is to certify that this work titled Perception of Teachers on Hack Mindset Method for teaching of Contemporary Environmental Issues in Geography: The case of Yaounde VI Municipality-Cameroon submitted to the department of Didactics of Discipline in partial fulfillment for the award of a Master Degree in Didactics of Geography is the original work of NGHOLAPEH FRED MUSI Matricule No: 16T3488.

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TABLE OF CONTENT

DEDICATION

This piece of work is dedicated to all my Lecturers, whose efforts have led me to this level, to Almighty God for good health and strength and my family for their constant support.

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LIST OF ABBREVIATIONS

CBA Competency Base Approach

C-BEN: Competency Based Education Network

CEDI Contemporary Environmental and Developmental Issues

CEI Contemporary Environmental Issues

DGES Geography and Environmental Studies Department

ESPS English Speaking Privates Schools

FCMDD Field Compilation Mfoundi Divisional Delegation

GBHS Government Bilingual High School

GESP Growth and Employment Strategy Paper

H.T.T.C Higher Teachers' Training College

HNSWGC Harmonized National Scheme of Work in Geography Cameroon

LCP Learner-Centred Pedagogy

LICs Least Industrialized Countries

MICs More Industrialized Countries

MINESEC Ministry of Secondary Education

NEEA: The National Environmental Education Act

OBA Objective Based Approach

PPDA Participatory Pedagogic Development Approach

PST: Problem Solving Teaching

PTDA Participatory Technological Development Approach

SDGs Sustainable Development Goals

UEPA: United States Environmental Protection Agency

UNESCO United Nation Education Scientific and Cultural Organization

UNG United Nation Goal

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF PHOTOS

ABSTRACT

This study investigates the perception of Geography teachers on the use of the Hack Mindset teaching-learning method of the CBA in the teaching of Contemporary Environmental Issues (CEI) to geography students in secondary schools in Yaoundé VI Municipality of Cameroon. It is an attempt to show the point of view of Geography Teachers on the use of the Hack Mindset teaching method as one of the many course design practices of the CBA that can competently transform learners into useful development agents. Questionnaires, interviews, focus group discussions and personal observation were the data collection instruments used for the investigation. Data collected was sorted manually. Microsoft Excel 2007 was also used to treat it. The data obtained was analyzed using qualitative descriptive and quantitative statistical methods. The major finding of the study revealed that about 75.95% of the sample population was ignorant of the Hack mindset teaching-learning method in teaching CEI in Geography and only 24.05% was aware of the method. Another major finding of the study revealed about 30.37% of sample population indicated that limited knowledge on Hack Mindset Method and its approaches is the major difficulty teachers are going to face. The study concludes that a reorganization of CBA in the teaching of CEI using two CBA teaching methods called Hack Mindset and Project based teaching-learning method appear to be an imperative for the development of life-skills in learners to solve environmental problems.

key words: Hack mindset Method, Teaching, Perception, Competency Base Approach, Contemporary, Environmental Issues in Geography.

RESUME

Cette étude examine les perceptions des professeurs de géographie sur l'utilisation de la méthode d'enseignement-apprentissage Hack Mindset de l'approche par compétences dans l'enseignement des questions environnementales contemporaines aux élèves de géographie des écoles secondaires de la municipalité de Yaoundé VI au Cameroun. Il s'agit d'une tentative de montrer le point de vue des professeurs de géographie sur l'utilisation de la méthode d'enseignement Hack Mindset comme l'une des nombreuses pratiques de conception de cours de l'APC qui peut transformer avec compétence les apprenants en agents de développement. Les questionnaires, les entrevues, les discussions de groupe et l'observation personnelle ont été les instruments de collecte de données utilisés pour l'enquête. Les données recueillies ont été triées manuellement. Microsoft Excel 2007 a également été utilisé pour le traiter. Les données obtenues ont été analysées à l'aide de méthodes statistiques descriptives qualitatives et quantitatives. La principale conclusion de l'étude a révélé qu'environ 75.95% de la population de l'échantillon ignoraient la méthode d'enseignement-apprentissage de Hack Mindset dans l'enseignement des questions environnementales contemporaines en géographie et que seulement 24.05% connaissaient la méthode. Pendant cette recherche, le chercheur a constaté qu'environ 30.37% de la population a indiqué que les enseignants auront une connaissance limité dans la méthode d'enseignement-apprentissage Hack mindset et ses approches. L'étude conclut qu'une réorganisation de l'APC dans l'enseignement de l'CIE utilisant deux méthodes d'enseignement de l'APC appelées la méthode Hack Mindset et la méthode d'enseignement-apprentissage basée sur le projet semble être un impératif pour le développement des compétences de vie des apprenants pour résoudre les problèmes environnementaux.

Mots Clés : la méthode Hack Mindset, l'enseignement, la perception, APC, Les problèmes environnementaux contemporain.

GENERAL INTRODUCTION

In the world, Africa and Cameroon in particular, it has been established that, the teaching of geography as the other social science is confronted with many challenges in the 21st Century. Ever since the adoption of the competent-based approach (CBA) with real-life situations as a pedagogic option in Cameroon schools, a teacher of geography should be versed with current teaching-learning methods, approaches and techniques and also research into new ones. This is more so because, today, indicators of measuring pedagogic excellence go beyond mere performance in official of end-of-course examinations.

Firstly, greater emphasis now is on teaching the student to become an independent learner and above all to develop life-long skills-attitudes and creative thinking, which remain the bedrock for competent acting and functioning in the society. This puts the learners at the nerve Centre of all teaching-learning activities. Yet, Geography teaching programs do not systematically raise awareness and to incite action for solving pertinent environment and development issues (Harmonized Geography Scheme, 2014). Thus, teachers and learners hardly play significant roles in the development of their communities using what they learn in Geography when they leave school.

Secondly, the present state of Geography teachers training curriculum in our Higher Teachers Training College in Cameroon, does not state out clearly which CBA teaching method enable teachers to teach Contemporary Environmental and Developmental Issues (CEDI) in Geography. Geography teachers rather orient their teaching of CEDI towards objective teaching method with more emphasis on concepts and not on developing life-long skills in learners. According to Tambo (2003), teaching methods are important components for the curriculum for they determine how effective the objectives would be attained.

Thirdly, developing well-structured environmental and developmental modules in Geography in most less industrialized countries like Cameroon has been a serious problem and a call for concern. The consequence has been a deficit of teaching skills and efforts put in place by teachers training schools' programs such that teachers and learners acquired skills and develop efforts which are geared towards solving recent environmental and developmental issues. This rationale forms the foundation of this research work. Therefore, the perception Geography teachers have about the use of a new CBA teaching method in teaching of Contemporary Environmental Issues (CEI) in order to foster environmental protection and the development of

our communities becomes very important. Effandi and Iksan (2007) stated that the quality of education that teachers provide to students is dependent upon what the teacher does in the classroom. The use of traditional teaching method such as lecture in geography classroom has been the underlying factor for students' poor performance in the subject.

Fourthly, this question has hardly been answered satisfactorily because of the inadequate training of Geography Teachers and limited research carried out in this area in the teaching of geography. Geography teachers trained in Cameroon training schools are better equipped to teach general geography with little emphasis on skills oriented geography such as environmental science management. Furthermore, existing environmental institutions and NGOs in Cameroon do not adequately include schools in their programmes as a way of fostering education in environmental issues in Cameroon, Centre Region and Yaoundé VI Municipality in particular.

In conclusion, the above considerations guided the choice of the main theme that run through the research work. Hence this has been the driving force behind this research work. This research work is structured into five chapters. Chapter one is focused on the general framework of the study, Chapter two on literature and theoretical framework, Chapter three presents the research methodology, Chapter four analysis and result findings and chapter five the conclusion and recommendations of the findings.

CHAPTER ONE:
GENERAL FRAMEWORK OF THE STUDY

1.0: INTRODUCTION

This chapter treats the context and justification of the study, the statement of problem, research question, research objectives, the limitations, delimitations and the importance of the research in the teaching-learning of Contemporary Environmental Issues (CEI) in geography. The sub-heads partly establish the theoretical framework for this study.

1.1: THE CONTEXT AND JUSTIFICATION OF THE STUDY

During and after independence, training schools in Africa trained Geography teachers to teach Geography based on memorization and location of important physical features such as mountains, rivers, lakes and others aspects. According to Davis (2001), students were taught to be able to do memorization and recitations on the most important features and locate them on a world map. According to UNESCO (1974), in an African context the contents, the teaching methodology and assessment of Geography in secondary and tertiary institutions appear inadequate and almost irrelevant. The training of teachers in the world and Africa in particular should focus on transforming them into veritable development agents with enormous skills. To Otilia (2015), the post-modern society and the challenges posed by the world nowadays are leading to numerous changes in teacher initial training and lifelong learning. According to Haas (1989), findings from the Association of American Geographers and National Council for Geographic Education shows that, significant efforts have been made to improve on the geography curriculum in general. But, the recent context in which we live, faced with CEI, there is an urgent plea that, the teaching methods and learning approaches should be oriented to a community based approach which is more of a participatory approach under the Competency Base Approach (CBA) (Boehm, 2000).

The need to reshape educational systems by means of cooperation and competition impose the necessity that the teaching field should benefit from a training that ensures teachers with capacity to adjust their teaching methods and style to meet changing demands. İt is understood that some of the problems relating to geography teaching are common in both developed and developing countries. Even though these problems differ from one country to the other, the common problems are mainly inadequate competence, teaching methods and textbooks,

measurement techniques used, evaluation techniques and use of tools. Hamza (2008), posits that it is necessary to review the general situation in some developed and developing countries in order to be able to draw better framework of the teaching problems and to draw attention to the fact that these problems are not peculiar only to Turkey. Ajibade and Raheem (1999) contend that major teaching problems encountered in the teaching of geography in Nigeria include lack of sufficient number of competent teachers, insufficient teaching materials, the inability to encourage students to involve in field works supporting the subject and failure to encourage students to love the subject. The above views appear relevant to the context of Cameroon. But above all, what are the perceptions of geography teachers in the face of existing issues and new pedagogic teaching methods? It is on this basis that this work is important to the context of Cameroon.

1.2: THE POSITION AND FORMULATION OF THE PROBLEM

As Cameroon chooses to become an emerging nation by the year 2035, its secondary education sector faces many challenges. It should offer quality training and education to most young Cameroonians within a context marked by large classes in secondary education and prepare them for smooth insertion into a more demanding job market worldwide, through a pertinent teaching and learning process. In addition, training tools have significantly evolved in their conception and implementation. A school that was mostly based on contextualized knowledge acquisition has given room, all over the world, for a school that aims at empowering learners to help them cope with complex and diversified real life situations. Instead of a school cut off from society, we now have a school deeply rooted in a society that takes into account sustainable development, local knowledge and cultures.

The implementation of this new school, prescribed by the law to lay down guidelines for education in Cameroon, and the necessity for socio-professional insertion require the adoption of a pedagogic paradigm for the development of syllabuses relating to **"The competence based approach with an entry through real life situations''.** In this perspective, new syllabuses for Secondary General Education, those of Teacher Education and Training Referential for Technical Education are part of this great change for the re-dynamisation of our education system. They are in line with the implementation of the provisions of Growth and Employment Strategy Paper (GESP, 2009) which, by the year 2010, specifies the minimum amount of knowledge which each Cameroonian is supposed to possess by the time they leave the first and second cycle of the secondary education according to New harmonized national pedagogic

teaching schemes of work (2014/2019). These syllabuses define essential competencies that should be acquired by learners within the first cycle and second cycles of secondary education, in terms of knowledge, know-how and attitudes. They equally define the framework that will enable teachers to organize their pedagogic activities.

1.2.1: Situational Observation

The new harmonized national pedagogic teaching schemes of work for the first and second cycles in Geography in Cameroon since 1978 till date have undergone numerous researches and changes in order to facilitate excellence in secondary education in general and Geography as a discipline in particular. This search is not new and the teaching of geography today is aimed at achieving the 21st Century challenging goal of the new pedagogic syllabuses designed for form 1 to upper Sixth in Cameroon (MINESEC, 2019). Therefore, a new participatory and innovative approach called Learner-Centred Pedagogy (LCP) was effectively introduced in Cameroon secondary schools in 2012 for the first cycle called Competency Based Approach (CBA) and in 2015 it was introduced into second cycle (MINESEC 2015) as a way forward and foundation for Cameroon Emerging Vision in 2035. However, despite, these pedagogic innovations at the level of approach, appropriate CBA teaching methods were not identified to teach Geography in general and CEI in particular. As such, learners find it difficult to acquire knowledge, skills and competence in identifying and solving real life environmental situations using knowledge from classrooms.

Thus, from this observation, the focus of this study was to serve as a proposition. The study proposes an investigation of teachers' perception on the Hack mindset teaching method. In so doing, we hypothesize that many teachers are not using the method and if our hypothesis is confirmed from the results of the general perceptions of geography teachers, then the method can be used in Teachers' training Institutions in Cameroon to trained Students Teachers in the field to develop competencies, skills and attitudes which can help them teach CEI to learners for the Junior, middle, lower and upper classes of the first and second cycles with a lot of participation and interest on the part of the learners within secondary schools.

1.2.2: The Statement of Research Problem

Skills shortage in the labour market, high unemployment rate and inability to provide solutions to recent environmental hazards among school leavers in Cameroon, triggered the questioning of the traditional teaching methods and the teaching-learning approaches used to teach

Geography as a whole and CEI in particular. It has come to notice that, there is need to revisit our school syllabus and to engage Geography teachers and learners in new innovative teaching trends in environmental education in Cameroon. A comparative analysis on how environmental issues called CEI was taught under Objective Based Approach (OBA), also the fact that the new geography scheme of work proposed CBA teaching techniques as teaching methods, there is a need to revisit CBA teaching techniques, approaches and methods in order to propose an appropriate CBA teaching methods that can be adopted in Cameroon for the teaching of social science subjects. This search for a newly innovative teaching trend under CBA framework in Cameroon, has let us to summarize the study into a **research problem: how do geography teachers perceive the use of "Hack mindset teaching-learning method approaches" in teaching CEI in Geography in Yaoundé VI Municipal?** Base on teachers' perception one could compare Hack mindset with teaching techniques proposed in the newly Harmonized scheme of work for first and second cycles (2014 and 2019) as CBA teaching methods.

1.2.3. The Research Questions

Preoccupied by this problem, the main research question is **"What is the perception of geography teachers on the type of CBA teaching-learning method" that** would guide Geography teachers to teach CEI lessons competently and provide opportunities from which learners can gain experiences that enable them acquire the knowledge, skills, attitudes and appreciation that will serve as tools in identifying and solving real life environmental issues? Three specific research questions were formulated to guide the study.

- What are the perceptions of Geography teachers about the use of Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?
- What challenges are geography teachers going to face when implementing Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?
- How effective can Geography teachers implement Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?

1.2.4: The Research Objectives

The main research objective is, "to establish the effective role Hack mindset teaching-learning method can contribute in teaching CEI lessons in geography within secondary schools in Yaoundé VI. Thus, three specific objectives designed to guide this study were:

- Examine Geography teachers' perceptions about the use of Hack mindset teaching-learning method in teaching CEI in geography in the study area.
- Investigate the challenges geography teachers are going to face when implementing Hack mindset teaching-learning method in teaching CEI in geography in the study area.
- To investigate how effective can geography teachers use Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé V

1.2.5: Contribution of This Study

Despite the fact that the CBA is a being implemented in Cameroon in the teaching of CEI in geography, the teaching methods choose for implementing this approach successfully appear not to have been thoroughly investigated. This is because teachers who have the mandate to operationalize workable CBA methods during learning sessions have different viewpoints in relation to CBA and it teaching methods in Cameroon. This study is therefore important. It presents the viewpoints of teachers on the use of the Hack mindset teaching method in the implementation of the CBA in the Cameroon context and teaching of geography and CEI in particular in Yaounde VI Municipality. From the literature review, the strategies of the Hack mindset have been successful elsewhere. So, there is need to know just how these methods are perceived in Cameroon, what challenges towards implementation? and way forward. This therefore makes our study different from other work because the study has its own unique significance. The following are considered significances of the study.

- **Improve on Geography Teaching methods as social science discipline**

With this work, the teaching of Geography as one of the many social science subjects will help better the structure of the subject with respect to teaching methods. Until now, CEI have been given a small percentage in the teaching of geography general. Irrefutably, isolated efforts have been made to discuss CEI in some Geography lessons in both first and second cycles but improvised temporary, lacked a well-structured and specific curriculum design for better learning outcome. This study might introduce CEDI via the teaching of CEI as a full independent branch in geography with an environmental science orientation. Thus, frequent use

of Hack mindset method in training Cameroonian citizens who are deeply rooted in CEI, and open to the entire world of environmental problems will enable learners in study of geography to serve as environmental agents and managers for the environmental development of their communities. So, studying and teaching CEI in Geography using Hack mindset is a significant contribution of this study.

- **The Pedagogical and didactic implications**

Another purpose of this study is to propose the following pedagogic and didactic dimensions in the teaching of CEI;

- Hack mindset teaching-learning method should be adopted as a sustainable method use in teaching CEI lessons within secondary schools across Cameroon.
- Hack mindset teaching-learning method could serve as a guideline framework for designing and implementing CEI content in Geography.
- Hack mindset teaching-learning method could be adopted as teaching method in other social science subjects like history, economics and others
- Hack mindset teaching-learning method could be adopted in Teachers' Training schools, Vocational Training Institutions across Cameroon as a main teaching and learning method.

This would go a long way to enhance, consolidate and foster the knowledge, skills, attitudes and values needed by Geography teachers in secondary and higher institutions to acquired efficient teaching skills in planning and teaching CEI with four main expected teaching-learning outcomes:

i. To efficiently and actively involved teachers' interest in teaching CEI with the goal to ensure environmental sustainability in LICs like Cameroon.
ii. To ensure that teachers contribute competently and sustainably in bring up pertinent, innovative and environmental-oriented learners so as to reduce the high rate of unemployment among school leavers in LICs like Cameroon.
iii. To ensure that, Geography teachers should be able to deconstruct their previous teaching approaches towards CEI and reconstruct a new teaching-learning approach with emphasis on competencies, skills, attitudes, values and practices after taking in-services training.

iv. To satisfactorily enhance learners' expectations on the significant roles they play in identifying and solving environmental problems of their communities when they leave school.

Based on the four teaching-learning outcomes, three (03) key concepts were employed to craft and give focus to the above expected teaching outcomes which are; **Competency based education, Hack mindset method, CEI in Geography for environmental development.**

- **Social Implications**

This study is useful to the government, local council and native community, because the finding from the study will enable urban and rural councils to encourage entrepreneurship amongst geography learners after and solve the problem of poverty. This because Hack mindset start small project teaching-learning approach focuses on how design small project via writing and sponsorship. Thus, this teaching method emphasis on community based approach in solving real life situations through the development of teachers and learners' competences and skills.

By this, some learners' can write on environmental related projects on issues such as management of waste disposal, deforestation, and pollution and urban disorders which could be sponsored by urban and rural councils. This study is also useful socially in that, it can be a major solution to the skills shortage and the high unemployment rate among school leavers in Cameroon. The question, "what can students do with the CEI knowledge they acquire so as to protection environmental and to ensure environmental sustainability of their communities"? This research work on hack mindset teaching-leaning approaches in the teaching and learning CEI is a possible solution if serious trainings and reflections are carried out towards this area of research.

- **The Psychological implications**

The study on Hack mindset method and the teaching of CEI in Geography will help teachers and students to overcome the current challenge in the psychology of education which is the difficulty in identifying the appropriate CBA teaching methods, strategies and learning contexts that can best contribute to the learning of all students. This also lay emphasis mostly on learners whose individual characteristics make their learning process more difficult. It will enhance one of the main theory in the psychology of education called the sociocultural approach to learning, which highlights the key role of interaction in children's learning.

Thus, the study proposed constructive, interactive and social cultural approach of teaching and learning CEI in Geography base on new CBA teaching method called Hack mindset and the

understanding of how learning under this method has aligned with a social model, which goes beyond all individual students' limitations or potentialities and focuses on contextual aspects that can enhance their learning experiences and results. In recent years, the interactive view of CBA learning based on this theory has led to the development of educational actions, such as interactive groups and dialogic literary gatherings, that have improved the learning results of diverse children, including those with disabilities using this approach. The psychological aim of this study is to analyze the social impact achieved by hack mindset method in teaching in other area and bridge the gap between successful educational approaches and actions adopted in Cameroon in the teaching of CEI in geography. The study is a motivational factor to all individual interested in the search of a better CBA teaching method in other social science subjects since the study is motivation to all students to who are taught through well-defined teaching-learning method.

1.2.6: Limitation and Delimitation of the Research Themes

1.2.6.1: The Research Limitation

The major limitation of this research work resides in the difficulty of examining the teachers' perceptions in the application of Hack mindset teaching-learning method and its approaches in the teaching of CEI in geography teaching syllabus in a larger sample population. The Yaounde VI municipality is simply a tentative result that should be confirmed with a much larger sample. Also, this work is unable to assess if geography teachers have the competences to efficiently and actively involve learner's interest in teaching CEI lessons in geography using Hack mindset teaching method.

The assumptions guiding the research work are:

1. Trained Geography teachers will actively teaching accept to integrate other new CBA teaching method such as Hack mindset teaching method in teaching CEI.
2. Geography teachers can actively use Hack mindset teaching-learning approaches to teach CEI and encourage learners to attend CEI lessons in Geography?
3. Geography teachers actively can use Hack mindset teaching-learning approaches to teach CEI efficiently and actively integrate learner's interest in course of CEI lessons.
4. students develop sustainable environmental skills after learning CEI lessons through the use of Hack mindset teaching-learning approaches encourage.

5. Hack mindset teaching-learning approaches in teaching of CEI ensure environmental Sustainability through the development human resources in secondary schools.
6. Finally, Hack mindset teaching-learning method can be adopted as a general CBA teaching-learning method by all social sciences in Cameroon.

1.2.6.2: The Research Delimitation

The study investigated what geography teachers think of the Hack mindset method based on the training received in training and in teaching schools, pedagogic seminars and workshops with focus on the teaching CEI in Geography.

1.2.6.3: Temporal Delimitation

This research work covers the period of 11 years, from 2012 till date. Moreover, this period was carefully selected because it was during this time frame that teaching methods in Cameroon gradually shifted from an Objective Based Approach to Competency-Based Approach called CBA (MINESEC 2012). Also, this period marked the first phase after CEDI was introduced in Cameroon secondary and high school Geography syllabus and programmes in particular (MINESEC 2010). Moreover, this time frame was to permit a systematic analysis of the evolution of teaching-learning approaches over time, based on degree of teacher's perception in the application of Hack mindset approaches. The temporal delimitation was focused on the following acquired teachers' characteristics in the course of teaching: competencies acquired in the course of teaching (longevity in teaching), age of the teachers, sex and status of the teacher in relation to the teaching of CEI in Geography using Hack mindset teaching-learning approaches.

1.2.6.4: Thematic Delimitation

The study focused was on the teaching of CEI in geography only in English Sub-system education in Cameroon and Yaounde VI in particular. Thus, the spatial delimitation of the study takes in to consideration only English speaking Private and Government Bilingual secondary schools within the Yaoundé VI Municipality. This study focused on geography teachers' perception on the adoption of the hack mindset teaching learning method and. Thus, this study is interested to find out if Geography teachers in secondary schools within Yaoundé VI are aware of Hack mindset teaching method and if its teaching approaches are feasible in teaching CEI in Geography. Moreover, the study is not interested on the future activities of learners after attending the CEI in geography and after leaving school.

1.2.7: Spatial Delimitation

The study was carried out in the schools found in Mfoundi Division. The large nature of the Mfoundi Division, turn to limited study in Yaoundé VI Sub-Division which has a surface area of 22.2km^2. The study covers the 12 quarters that made up Yaoundé VI which are: Biyem-Assi, Melen, Etoug-Ebe, Mvog-Betsi, Obili, Nkolbison I and II, Elig-Effa, Zibi, Mendong, Simbock, Nkolnzie and Jouvence. The choice of the case of Yaoundé VI Sub-Division is because it harbors many English speaking private and government schools in Yaoundé. Within this spatial space delimited, schools were randomly selected from the 12 quarters base on a random technique and school proximity or distance criterion was highly considered. Figures 3.1 in chapter 3 delimit and spatially illustrate some of the randomly selected schools from the study area.

1.2.8: The Spatial Location of the Study Area

This section of the work focuses on the spatial delimitation of the study area with respect to latitudinal and longitudinal location, division of locate of the study area, number of quarter involved and schools selected. Yaoundé VI Sub-Division (Fig.3.1) as a case study is found in Mfoundi Division of the Centre Region of Cameroon. It is one of the seven Sub-Divisions that make up the Mfoundi Division. It was created in 1993 by a Presidential degree n^{0}93/312 of 25 November 1993 after the modifying the degree n^0 87/1365 of 24 September 1987 permitting the creation of urban council in Yaoundé. It covers a surface area of 22.2km^{2}It lies between latitudes 3^{0}50’ and 3^0.84’ to the North of the Equator and between Longitudes 11^0 29’ and 11^0.48 to the East of Prime Meridian. Yaoundé VI Sub-Division is border to other Sub-Divisions found in the Mfoundi Division: to the North by Yaoundé II (Biyem-Assi Municipality), to the South by Yaoundé III (Tsinga Municipality), to the East past of Yaoundé III and to the West by Yaoundé VII and Mbankomo Municipalities respectively).

The study area is made up of 12 major quarters which are: Biyem-Assi, Melen, Etoug-Ebe, Mvog-Betsi, Part of Obili, Nkolbikok I and II, Elig-Effa, Zibi, Mendong, Simbock, Nkolnzie and Jouvence. From the 12 quarters only English Speaking Private Schools (ESPS) and Government Bilingual schools (GBS) within the Yaoundé VI were located and randomly selected (Table.1.4).

1.2.9: Conclusion

Although many course design practices purported to make positive contributions in teaching learners of CEI in geography to acquire life-skills, there appears to be little evidence available

on the viewpoints of geography teachers on one of the methods of the competence based approach called Hack mind-set. That is why our investigation focused on the perceptions of geography teachers on the use of the hack mind-set method in the Cameroon context.

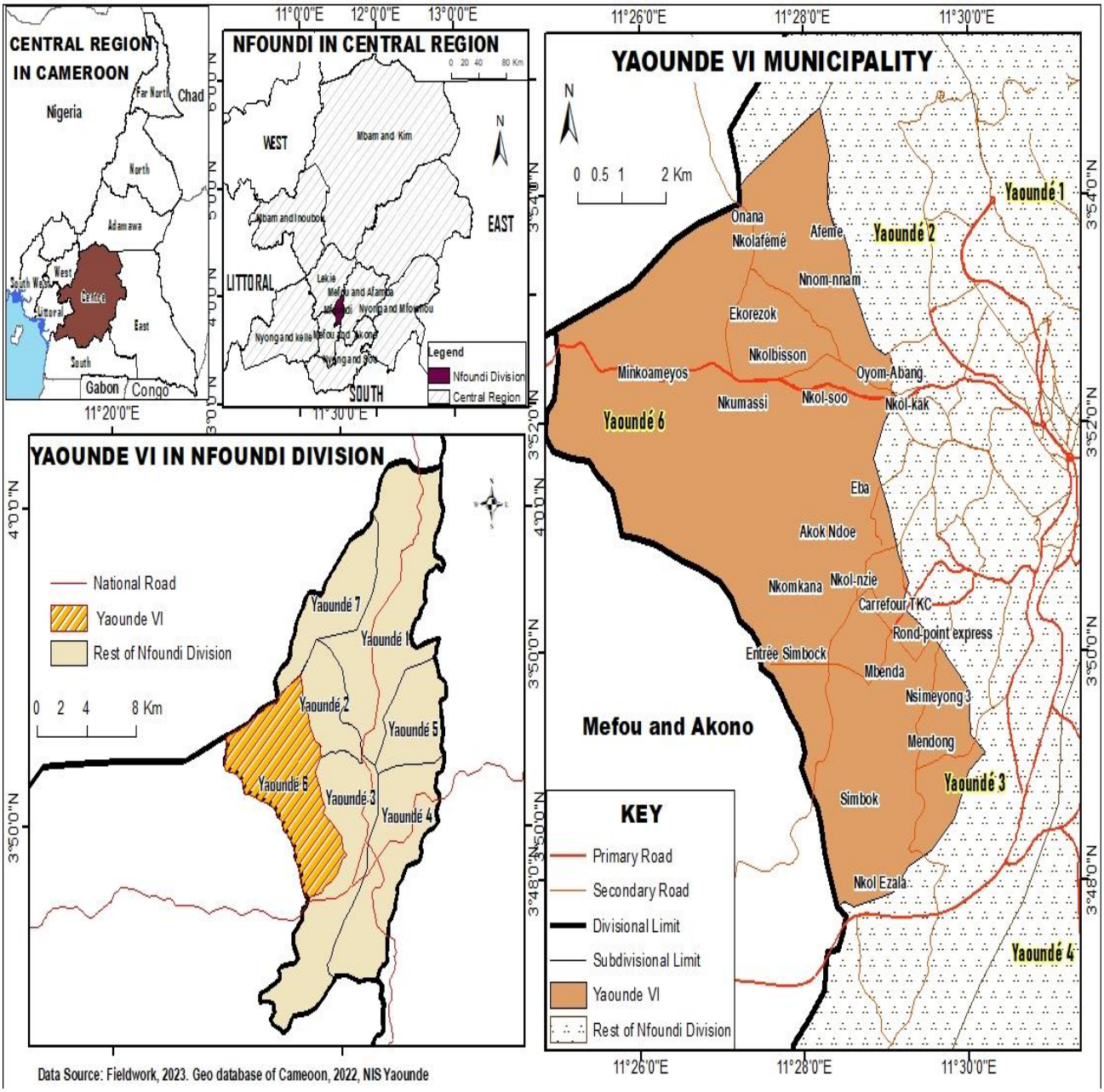

Figure 1.1: The Location of the Yaounde VI Municipality

Source: Adapted from the administrative map of Cameroon NIC 2021.

Their selections were based on two criteria: school proximity (distance criterion) and the number of ESPS and GBS.

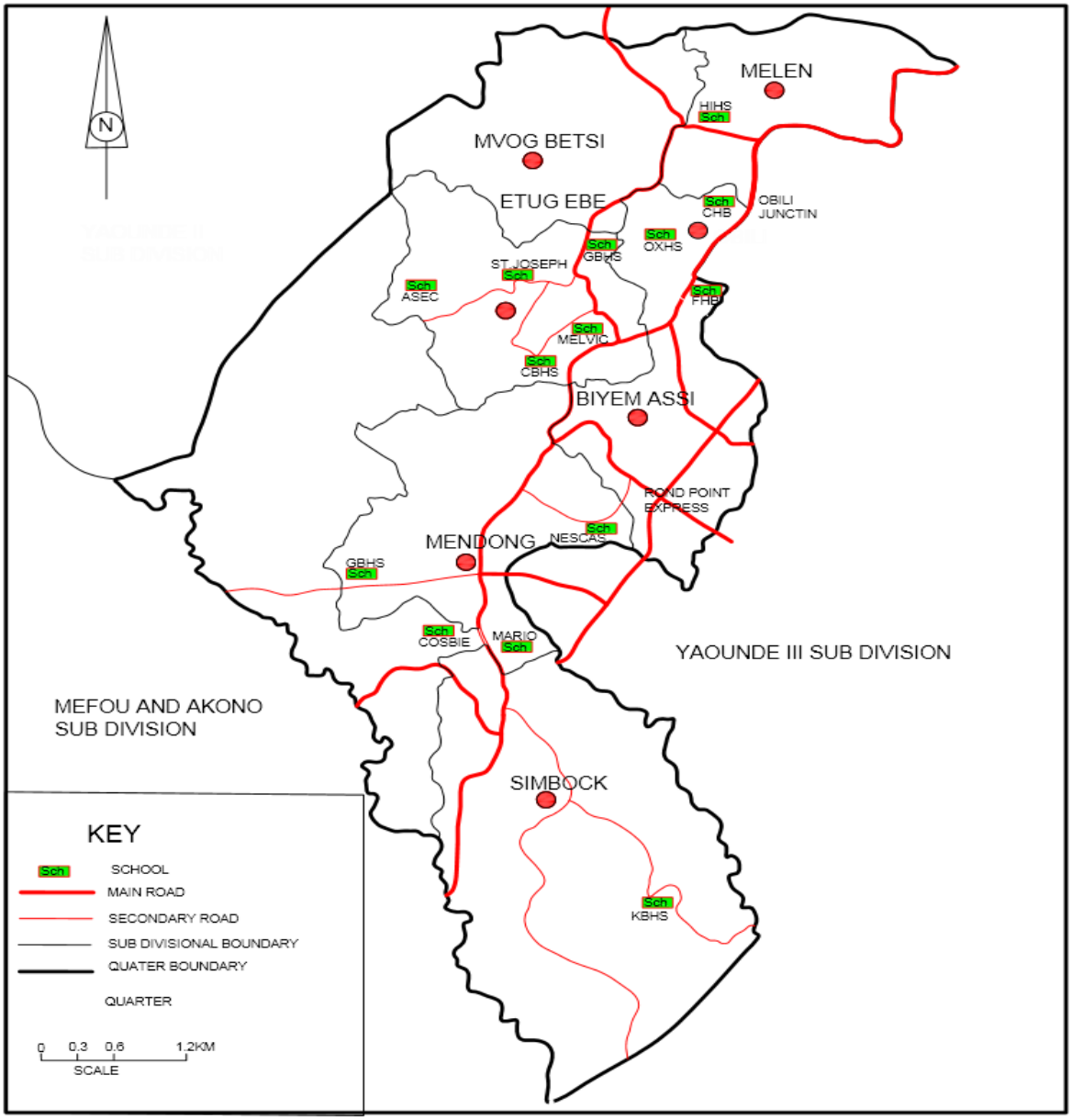

Figure 1. 2: Location of Sample Schools of the Yaounde VI Municipality

Source: Adapted from the administrative map of Cameroon NIC 2021

This chapter titled the general framework of the study has examined the context and justification of this study, the position and formulation of the research problem, the delimitations and limitations of the study, the significance of the study. All these aspects give impetus to the place of this investigation; the necessity for using the hack mindset method. In chapter two, a presentation of the literature review and the conceptual framework of the investigation is presented.

CHAPTER TWO
THE THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.0: INTRODUCTION

The present chapter deals with the theoretical framework of this research, the definition of operational concepts and a review of relevant works linked to teachers' perceptions on Hack Mindset method (HMM) in Teaching CEI in geography. The contribution of this present study is highlighted.

2.1: THE THEORETICAL FRAMEWORK OF THE RESEARCH

This section of this chapter, as earlier said, focuses on the theoretical frameworks that guide this study. These theoretical frameworks are the experiential learning theory and the constructivist theory.

2.1.1 The Experiential Learning Theory

Kolb & Kolb (2012), states that people learn through experience which is in line with John Dewey, Kurt Lewin and Jean Piaget experiential learning theory (1984). Dewey (1897), believes that "education must be conceived as a continuing reconstruction of experience" (p.5). This experience is gained by active learning, thinking, feeling and perceiving. The experiential learning is considered as the result of the interaction between the human and his or her environment (Kolb & Kolb, 2012). This theory will enhance the work because it will have served as a base to draw from past environmental issues and construct a strong teach method.

2.1.2 The Constructivist Theory

According to Harrigan (2021), the experiential learning theory served as the basis for the development of the constructivist theory, which states that learners do not acquire knowledge but actively construct it themselves. This theory was developed by Jerome Bruner, John Dewey, Lev Vygotsky and many other scholars. Constructivists claim that learners do not transfer ready knowledge from outside but create their own meaning and interpretation of the world through gained experience (Ertmer & Newby, 1993).

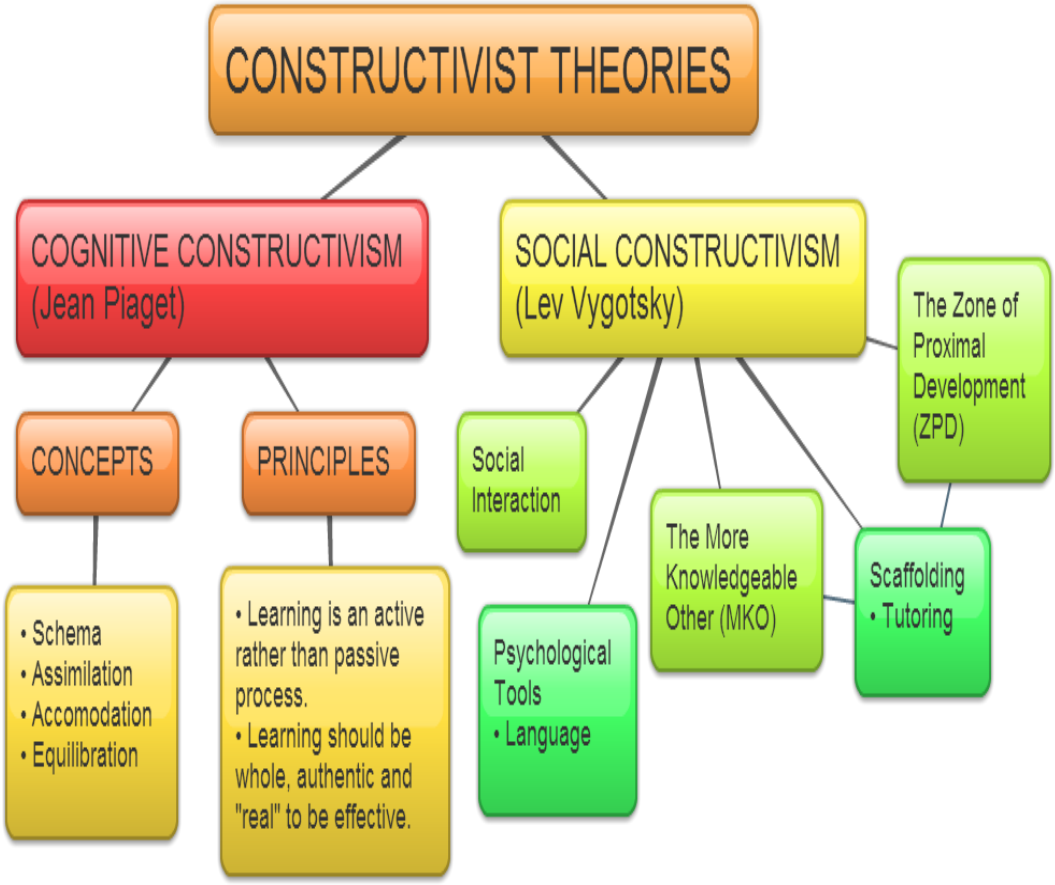

Figure 2.1. Constructivist theory and its contribution to implementation of Hack mindset teaching method. Source: Simply psychology by Saul McLead (2020).

There are different types of constructivism that educators can use to find success with this learning theory. They include;

1. Cognitive constructivism.

Cognitive constructivism focuses on the idea that learning should be related to the learner's stage of cognitive development. These methods work to help students in learning new information by connecting it to things they already know, enabling them to make modifications in their existing intelligence to accommodate the new information. Cognitive constructivism comes from the work of Jean Piaget and his research on cognitive development in children.

2.Social constructivism.

Social constructivism focuses on the collaborative nature of learning. Knowledge develops from how people interact with each other, their culture, and society at large. Students rely on others to help create their building blocks, and learning from others helps them construct their

own knowledge and reality. Social constructivism comes from Lev Vygotsky, and is closely connected to cognitive constructivism with the added element of societal and peer influence.

3.Radical constructivism.

Radical constructivism is very different from cognitive and social constructivism. It focuses on the idea that learners and the knowledge they construct tell us nothing real, only help us function in our environment. The overall idea is that knowledge is invented, not discovered. The things we bring to the table make it impossible for us to have truth, only interpretations of knowledge. Radical constructivism was developed by Ernst von Glasersfeld in 1974.

2.1.3: The implementation of constructivism theory in education and classrooms through the use of Hack mindset teaching method in teaching CEI in geography

It's important to understand how teachers can apply constructivism inside their classroom to create a unique learning environment for students. In constructivist classrooms, the following must be considered;

- The teacher has a role to create a collaborative environment where students are actively involved in their own learning.
- Teachers are more of facilitators of learning than actual instructors.
- Teachers must work to understand the preexisting conceptions and understanding of students, then work to incorporate knowledge within those areas.
- Teachers will also need to adjust their teaching to match the learner's level of understanding.

Thus, Constructivist classrooms are often very different from normal classrooms in many ways. Constructivist classrooms focus on student questions and interests, they build on what students already know, they focus on interactive learning and are student-centered, teachers have a dialogue with students to help them construct their own knowledge and students work primarily in groups. Constructivist classrooms often have teachers who do small group work, collaborative and interactive activities, and open dialogues about what students need in order to find success.

My study is based on the combination of these two theories. Both experiential learning and constructivist theories lead to the theoretical foundations of Hack mindset method. Hack mindset provides a framework for cohesively combining a series of educational strategies.

Many scholars admit that there are many benefits of using Hack mindset method with students, William and Flora Hewlett Foundation (2013), Josh Linkner (2017), Mark Hofer and Lindy L. Johnson (2017). This work investigates teachers' perceptions regarding Hack mindset in order to explore the various benefits and possible challenges of using Hack mindset method in the teaching CEI in geography using the CBA in the Yaounde VI Municipality of Cameroon.

2.2: OPERATIONAL DEFINITION OF CONCEPTS

The concepts of the study include: Teachers' perceptions, Hack mindset method and approaches and Didactics of CEI in Geography.

2.2.1: Teachers' Perceptions

Leinhardt & Smith, (1985), define teachers' perceptions as the "mental representations and constructions that teachers create about their students, their subject matter, and their own teaching practice, which influence their teaching behaviors and decision-making processes". These perceptions can vary based on factors such as prior experience, beliefs, and values. In this study, teachers' perceptions are all the views which geography teachers hold as helpful to shape geography students' construction and successful development of life skills in the teaching of CEI in geography.

2.2.2: Hack mindset method

''Hack mindset'' was first called ''deeper learning'' or ''real time learning'' in competency Based Education (CBE) by the William and Flora Hewlett Foundation (2013) in USA. Hewlett Foundation defines Deeper Learning as ''an umbrella term for the skills and knowledge that students must possess to succeed in 21st century jobs and civic life. Thus, ''Hack mindset method'' was first used by Josh Linkner (2017), as ''Hacking'' a criminal act using computer software tool approach to violate or rebuild cyber-security defences. Despite hacking negative dimension, it serves as a powerful model of growth and innovation in teaching-learning method.

Hack mindset is an adjective means ''being able to produce the intended good result". Hack mindset as a teaching method reported by Mark Hofer and Lindy L. Johnson (2017), is define as ''an effective CBA teaching-learning method which guide students using real life situations for the development of their potentials, skills and values by using bias to action approach, fail forward approach and start small approach''. According to the Hack Educational weekly news and Education week research centre, (2016), a national study conducted in USA, indicates that

98% of teachers agreed that integrating Hack mindset method in Competency base education (CBE) in America will lead to improvement in student learning skills as well as performance. In this study, Geography Teachers are considered as hackers who have the ability to used Hack mindset to unlock a set of potentials or competencies from geography students and to help students master and develop a keen understanding day to day environmental problems in order to apply their knowledge to problems in the classroom and on the job market.''

2.2.3: Hack Mindset Method Teaching-Learning Approaches

Hack mindset method of teaching-learning used three potential approaches in the process of knowledge acquisition. They include;

1. ''Bias toward action approach''

Bias toward action can be defined as a discovery learner-centred teaching approach without assistance from the teacher. In this approach, students carry out investigations, engage in fieldworks, group work and do assignments which permit learners to constitute previous knowledge on CEI in geography without their teacher's assistance Fig 2.2.

Figure 2.2: Tom Vander Ark (2015) Don't over think it, just try it

2.''Fail forward approach''

The Fail forward referred to as a Co-constructivist new innovative teaching-learning learner-centred approach which involves the teacher and the learners in a classroom setting with integrated activities (handed over documents, presentation and interviews). This approach in this work, the Geography teacher guides his/her students with follow up questions so to aid learners on how to build knowledge from scattered knowledge in order to minimized the failures recorded in the first approach called Bias to action Fig 2.3.

Figure 2.3: Tom Vander Ark (2015) Use "failures" as opportunities to learn

3.‘‘Start small approach’’

The Start small is defined as a problem solving teaching-learning learner-centred approach where the teacher serves as a director or a cooperating teacher to ensure that the learner realized a project based on the knowledge acquire in the first two approaches. In this approach, it is more of an opportunity to encourage geography teachers on how to engage practical work on CEI out of classroom which involves small project writing and a problem model approach in handling pressing environmental issues. For example, after teaching waste as an environmental pressing issue in Yaoundé VI Municipality, learners are obliged to write small projects to their local councils for sponsor and implementation Fig 2.3.

Figure 2.4: Tom Vander Ark (2015) Keep the goal small, because with time it will mature to a bigger goal or project.

2.2.4: Competency Based Approach (CBA)

CBA is a pedagogic approach in the teaching-learning transactions which has as goals to inculcate in students or learners' skills, attitudes, and moral values during and after a lesson. This work investigates the perceptions of teachers on how Hack mindset method as am American base CBA teaching method and it approaches can be us to teach CEI in Geography. In short, ideas of Tom Vander Ark (2015), who stipulates that ''don't over think it'', just try it, use ''failures'' as opportunities to learn and try to keep the goal small, because with time it will mature to a bigger goal or project guided the choice of the study**.**

2.2.5: Didactics of CEI in Geography

- **Didactics**

'Didactics' according to the French Language Dictionary by Astolfi. J. Pierre and Develay. M (1989, 2016) is an adjective summarizing all what concerned teaching. It is defined as an assembly of methods, approaches and techniques use in the proper transmission of knowledge within a particular discipline. Some 350 years ago didactic was known as pedagogy and this is because didactics does not only concern with the way teaching take place in classroom but it is also concern with teacher's epistemological reflection on knowledge and learner's relationship with knowledge. Didactics according to Astolfi Develay (1989) studies the pedagogy interactions that are established between teachers and learners in the teaching learning situations after looking at the didactic triangle (figure 1.4, 1989). From a modern stand point, teaching didactics and critical didactics gives birth to innovative didactics.

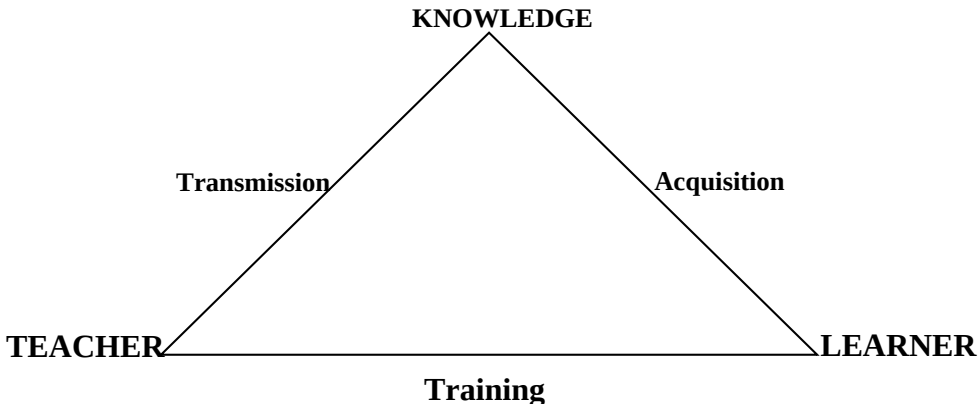

Figure 2.5: Didactic Triangle

Source: Astolfi Develay (1989).

- **Didactics of Geography**

According Jean. F Themines (2016), defines didactic of geography as a science which studies a particular teaching domain, phenomena, and conditions of transmitting cultures by teachers and acquiring knowledge by learners within a formal setting about the world. Didactics of geography in this work, investigate and explain new teaching-learning methods, approaches and techniques which can be apply in teaching CEI lessons in geography using new teaching methods.

- **Teaching-learning**

Onwuka. Uga et al, (1981) view teaching as ‘‘the process of creating or providing opportunities from which learners can gain experiences that will enable them acquire the knowledge, skills, attitude and appreciation that will serve as tool in life’’. According to Johny. K Joseph (2017), defines learning as ‘‘the act of acquiring knowledge and acquisition of new behaviour as a result of experience”. Educational researchers and pedagogues prefer ‘’teaching-learning’’ instead ‘‘teaching and learning’’. Teaching-learning refers to a pedagogy, studying and implementation of teaching-learning methods by a teacher or pedagogue.

- **Teaching-learning method and Technique**

Manoj. Bs (2019), defines Teaching-learning method as an advanced teaching aim at enhancing teaching and learning in higher education institutions using a multi-modal teaching and learning tracks support mainly by lecture track. In short a regular and systematic way of accomplishing teaching-learning outcome. Elizabeth Barkley et al (2020), defines teaching-learning technique as a comprehensive resource that offers college teacher with a dynamic model for engaging students teaching and learning strategies as well as procedures that have been proven helpful to teachers from a wide varieties of disciplines and motivate learning outcomes. Pedagogically, both teaching-learning method and techniques give rise to “methodology”. And “methodology” refers to systematic way of presenting subject matter and learning experiences with a view to achieving set goals and outcomes.

- **Contemporary Environmental Issues (CEI) in Geography**

According Inspectorate of Pedagogic for the Social Sciences (2019), Cameroon Second Cycle Geography Syllabus integrate CEI as part of Module 7 titled; ‘‘Contemporary Environmental and Developmental Issues’’(CEDI). Define as understanding and managing recent natural and

man created environmental problems that of global concern. According Nchangvi. S.K (2020), CEDI are any real life situations which are either natural and human issues which are of global concern like climate change, global warming, drought, desertification, floods, soil erosion, deforestation, pollution. The human related issues are; poverty, underdevelopment, trade deficits, globalization which are challenging mankind. According to this study, CEI is defined as any natural and man-created environmental issues that are of global concern because these issues affect man and his environment negatively due to man's neglect. (see Appendix)

2.3: LITERATURE REVIEW

2.3.1: History and Development of Hack Mindset Method

The history and the development of Hack mindset method as an American base teaching started in the summer month of (2013) were many American schools had the opportunity to nominate themselves to introduced Deeper Learning School involving different school leaders. School leaders were selected from twenty schools with the goal of presenting a diverse national distribution of new and improved schools teaching using learning approach called Deeper Learning and they share a common purpose to give all students the opportunity to learn in a Deeper Learning environment.

In order to lay a solid foundation for deeper learning environment, Getting Smart team conducted interviews and then gather additional information using questionnaires from schools' leaders such as classroom examples and student success stories. Responses from dozens of schools exhibited strong alignment with the Hewlett Foundation's Deeper Learning competencies. Result shows that the schools systematically engage young people as scientists, writers, producers, inventors, collaborators and problem solvers in ways that provoke inspired learning and valuable preparation. The main was to arrive at more practical definition what is hack mindset method.

In an effort to define Deeper Learning also called Hack mindset, the Hewlett Foundation has identified six Deeper Learning competencies that are essential to prepare students to achieve at high levels and succeed in college, career and civic life:

1. **Master core academic content:** Students must show understanding of knowledge in a particular academic discipline and must be able to transfer knowledge to other situations.
2. **Think critically and solve complex problems:** Students must think critically in order to solve complex CEI problem by apply tools and techniques which simple and systematic to

understand. These tools to used are data analysis, statistical reasoning, and scientific inquiry as well as creative problem solving.

3. **Work collaboratively:** Students must cooperate in order to identify and create solutions to academic, social, vocational, personal and CEI challenges.
4. **Communicate effectively:** Students are to clearly organize their data collected, findings and thoughts in both written and oral communication.
5. **Learn how to learn:** Students must monitor and direct their own learning.
6. **Develop academic mindsets:** Students must develop positive attitudes and beliefs about themselves as learners that increase their academic perseverance and prompt them to engage in productive academic behaviors. Students are committed to seeing work through to completion, meeting their goals and doing quality work, and thus search for solutions to overcome obstacles.

Mark Hofer and Lindy L. Johnson (2017), stipulates that, in order to questionnaires promote Deeper Learning in schools and disciplines, Project Based Learning (PBL) blended key strategies identified as a teaching method called Hack mindset method must be adopted and implemented in different schools and disciplines in America. In 2017 Mark and Lindy reported Hack mindset as a teaching method starts from small scrappy experiments called ‘‘Hacks’’. Hacks may start small, but they're built on research based practices that lead to Deeper Learning according to William and Flora Hewlett Foundation (2013) in USA.

Mark and Lindy believe “Big Changes Start Small”. From a School Retool with a unique learning experience from school leaders a new Co-Designing Schools Toolkit called The Hack Mindset was launched in order to question what we mean when we talk about hacking? Hack mindset method is defined as ‘‘Don’t over think it, just try it; Use "failures" as opportunities to learn but keep the goal small, which might later mature into a big project. Mark and Lindy incorporates critical learning, creative thinking skills and project based learning approaches to meet emerging educational objectives using a more sustainable teaching method called Hack mindset.

1. Critical Learning Approach

Critical Learning approach is a complex mental process, paying attention to details, selecting relevant information, analyzing carefully, making judgments, and meta-cognitive reasoning via reflection and higher-order planning (Cottrell 2005).

2. Creative Thinking skill learning Approach

Creative thinking skills is the ability to look at problems and situations in new ways, to be able to generate new ideas and provide original and appropriate solutions to problems (Sternberg 1999, 2003).

3. Problem based Learning Approach

In the problem based learning approach the teacher acts as a facilitator and Kolodner et al (2003) list a sequence of PBL classroom practices:

1. Analyzing a problem scenario and facts in groups;
2. Hypothesizing and explaining how to solve the problem;
3. Dividing up the learning issues within the group, learning new knowledge which is needed to solve the problem;
4. Returning to the problem; approaches to learning: evaluating the hypotheses and learning issues;
5. Repeating the learning cycle until the problem is successfully solved;
6. Reflection and abstraction.

2.3.2: Teaching methods, approaches and model of teaching CEI Using Hack Mindset Method.

Several scholars and pedagogues have proposed different methods, approaches and models of teaching CEI.

Karin Kirk (2007), argues that teachers should ‘‘teach the science first’’ even though most environmental topics are a blend of science, policy, economics and human impacts, it may be helpful to separate these into three distinct sub-topics; present the science objectively, using data and relevant examples. In this work, geography teachers will have used the bias to action approach to teach the science first on CEI in geography.

Schweizer and Kelly (2005), posit that teachers should ‘‘teach with data’’ using statements like "species are going extinct at an alarming rate," "wetlands are being turned into strip malls," and "the climate is getting hotter" are emotional statements (even if true) and will elicit emotional responses in your students rather than risk sounding like an alarmist, let the data speak for itself. This study, will therefore help us to elaborate more on the Fail Forward approach of Hack Mindset teaching method in teaching CEI as students using data to evaluate opportunities in every environmental problem.

Iozzi (1989) holds that let teachers teach by using active learning techniques: learners learn better when they can learn it for themselves, and this is especially true for topics that are potential turn-offs for students. Environmental issues lend themselves to teaching techniques like using local examples, gathering data from the field, using role-playing, debates and participating in environmental projects. Schweizer and Kelly, (2005) Controversy, ambiguity, and topics with incomplete or missing evidence can be used constructively (but need to be introduced judiciously) Engaging controversial topics, or topics that have no clear-cut answers, can create an environment where students are motivated to learn more out of curiosity or imminent need, Students can be encouraged to review what is known, to identify what additional information is needed to solve the problem, and to continue the search to find and critically examine new information Edelson (2001). this study will therefore help us to elaborate more on the Fail Forward approach of Hack Mindset teaching method in teaching CEI as students will use data in evaluating themselves and see opportunities in every environmental problem.

Karin Kirk (2007) bears in mind that teaching an environmental issue is all that stressful. Meaning; it’s not all doom and gloom: Certain environmental topics can be downright depressing. However, there are also many environmental success stories. Strive for a balance in which students do not feel overwhelmed by a preponderance of "bad news". After all, environmental successes provide relevant examples of how problems can be overcome. Thus, this study on Hack Mindset teaching method, in teaching CEI in geography will help teacher use these method approaches to help the students always see opportunities in all environmental problems following bias to action, fail forward and start small approaches.

Corney (1998); According to him, clearly define your role and your teaching approach: There are many ways to teach environmental issues. Before jumping into your curriculum, consider what your desired outcomes are and what approach you will take. Is it your place to teach just

the relevant scientific processes, to promote an awareness of environmental issues, or to lead students toward a shift in their own environmental behavior? In the classroom, do you assume the role of environmental guardian, a free-marketer, or a devil's advocate? There are advantages to various approaches, but it's important to consciously consider what your goals are and how you can best achieve them. Base on the study and in line Corney (1998) this study will clearly define the role of a teacher and the approaches he will adopt in teaching environmental issues in schools in Yaounde VI.

Kirk and Thomas, (2003); said, let teachers Lead by example, but don't preach: We all know the stereotype that secondary school teachers drive tiny, efficient cars and live an eco-minded lifestyle. Regardless of whether or not this describes you, it's best to avoid talking down to your students for their own personal choices. Preaching to the class about what's "good" and what's "bad" will likely have the opposite effect than you intended; it can be a major turn-off for students. If your goal is to promote environmentally favorable behavior in your students, consider a hands on project that will challenge students to consider the environmental impacts of their own actions.

Environmental Education has many definitions; most environmental educators have had similar goals throughout the years. In the 1960s, environmental education programs began appearing throughout the country due to increasing awareness of environmental deterioration. As early as 1974 the Virginia State Department of Education developed a K-12 environmental education curriculum guide. Several definitions of environmental education have also been put forth by different groups. For this article we chose a definition of goals for environmental education that was suggested in the Project Wild (Western Regional Environmental Education Council, 1983) curriculum guide. ‘‘The goal is to assist learners of any age in developing awareness, knowledge, and commitment to result in informed decisions, responsible behaviour and constructive actions concerning wildlife and the environmental upon which all life depends” Klein and Merritt (1993 and 2015). Hungerford, Peyton, and Wilke (1980) developed a set of instructional goals for environmental education and was validated by numerous environmental educators and used worldwide since 1980. The four major goal levels, as summarized by Hungerford and Volk (1990), are listed below:

Goal Level 1. The Ecological Foundations Level: This level seeks to provide learners with sufficient ecological knowledge to permit him or her to eventually make ecologically sound decisions with respect to environmental issues.

Goal Level 11. The Conceptual Awareness Level-Issues and Values: This level seeks to guide the development of a conceptual awareness of how individual and collective actions may influence the relationship between quality of life and the quality of the environment and results in environmental issues that must be resolved through investigation, evaluation, values clarification, decision making, and finally, citizenship action.

Goal Level Ill. The Investigation and Evaluation Level: This level provides for the development of the knowledge and skills necessary to permit learners to investigate environmental issues and evaluate alternative solutions. Similarly, values are clarified with respect to these issues and alternative solutions.

Goal Level IV. Action Skills Level-Training and Application: This level seeks to guide the development of those skills necessary for learners to take positive environmental action for the purpose of achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment. (p. 13) Curriculum guides such as Project WILD and many other environmental education materials have been designed to meet these goals using an interdisciplinary approach at all grade levels (K-12). Ideally, students in every subject and grade level will expand their knowledge and clarify their values and attitudes related to the environment. Although the proponents of objectivism suggest that a teacher's role is to transmit knowledge to students, the range of learning outcomes suggested by the four goal levels demands the use of methods that are far more complicated than simply transmitting knowledge through lectures to students. Although lectures may still be the primary teaching tool in most ecology classrooms, most educators realize that inquiry lessons, individual projects, and independent study are some of the more effective methods of meeting these goals (Schwaab, 1982). The National Environmental Education Act, passed in 1990, reemphasized the need to increase public under- standing of the natural environment and to advance and develop environmental education and training. The act created an office of environmental education that serves a variety of roles including support, development, and dissemination of model curricula, educational materials, and training programs for elementary and secondary students and other interested groups (National Environmental Education Act of 1990, p.3).

Constructivism a review of the literature on traditional classroom instruction in science suggests that the teacher informs students of the facts and nature of science by lecturing or demonstrating laboratory activities. This type of instruction is based on a theory that students learn because teachers teach. An alternative approach is that of constructivism. Constructivism has been

described (Lerman, 1989) as consisting of two main hypotheses: “Knowledge is actively constructed by the cognizing subject, not passively received from the environment,” and “Coming to know is an adaptive process that organizes one’s experiential world; it does not discover an independent, pre-existing world outside the mind of the knower” (p. 211). Jonassen (1991, p.9) made comparisons between objectivism and constructivism. (Excerpts from their comparisons appear in Table 1). Clements and Battista (1990) listed five tenets of constructivism that are embraced by different proponents: (a) “Knowledge is actively created by the child, not passively received from the environment”; (b) “Children create new knowledge by reflecting on their physical and mental actions”; (c) “Ideas are constructed or made meaningful when children integrate them into their existing structures of knowledge. No one true reality exists, only individual interpretations of the world. These interpretations are shaped by experiences and social interactions”; (d) “Learning is a social process in which children grow into the intellectual life of those around them” (Jerome S. Bruner); and (e) “When a teacher demands a learner use set mathematical standards, the sense making activity is seriously curtailed” (p. 34). After reviewing the ideas of various authors, we developed a list of four major components of constructivism to explain how teachers might implement these ideas in designing curricula. There are four main components of a successful constructivist lesson or unit that have been identified for use by the classroom teacher:

a) introduction of a real- life problem by the students or teacher for the students to resolve,
b) student-centered instruction facilitated by the teacher,
c) productive group interaction during the learning process, and
d) authentic assessment and demonstration of student progress.

At the beginning of a lesson or unit, the teacher or students pose a real-life problem for students to investigate. According to Wheatley (1991), “The core of problem centered learning is a set of problematic tasks that focus attention on the key concepts of the discipline that will guide students to construct effective ways of thinking about that subject”. He suggested that a teacher needs to modify questioning based on an understanding of students’ prior knowledge and thought processes. A problem for one person may have been previously resolved by another. After the problem has been presented to students, they must take initiative and risks in attempting to solve the problem. Students should ask questions of themselves and others that help them to clarify their positions and validate learning. As students engage in investigating problems, they are responsible for making sense of their world and constructing new relationships. Students should be actively engaged in classroom learning tasks;

experimentation, investigation, observation, and discussion. Students should be able to choose their own methods for solving problems and request the resources and materials they need to arrive at solutions. Teachers can facilitate this kind of learning by setting up a conducive physical environment to the construction of knowledge, assigning appropriate tasks, providing guidance, making resources and materials available to students, and supporting students in their interactions with others (Chaille and Britain, 1991).

Teachers also need to allow students adequate time to draw conclusions and answer questions to their own satisfaction. For learners to practice new skills, they must interact with their peers. Explaining or defending views stimulates learning (Wheatley, 1991). By working in groups, students learn listening and group interaction skills as well as discover new insights and ideas related to the problem they are investigating. The teacher must teach and model appropriate group interaction skills, decide on the size and makeup of the groups, organize the classroom and lesson in a manner conducive to group learning, and monitor groups to help them stay focused and work through difficulties (Parsons, 2017). Finally, teachers must design authentic assessments to measure the learning that has occurred in a constructivist learning environment. According to Lauterback and Ochs, "Performance assessments determine whether students can use concepts, knowledge, and skills they have learned by requiring them to perform a task or create a product." They list the following components for a good performance task:

1. The task is authentic. It simulates a real world challenge and gives students a real world role in a real world setting.
2. The task is rich in its design. Students are allowed to develop alternative solutions; there is no right answer.
3. The task requires students to participate actively. This might include working in cooperative groups similar to real world project teams.
4. The task includes essential rather than tangential ideas. In the sciences, these essential ideas can be represented by the broad based themes of science and the habits of the mind (attitudes, values, and skills) outlined in Project 2061's Science for All Americans.

Between (991-1992) Constructivist teaching easily lends itself to the use of authentic measurement of student learning. According to Jonassen (1991), "Effective assessment should be integrated into instruction". While students are actively engaged in solving real-life problems, the teacher has an opportunity to evaluate students on a variety of levels. A teacher can develop checklists for use during learning activities or evaluate products based on specific

habits of mind and comprehension of concepts. The teacher needs to clarify the skills and processes that are being evaluated at a given time and set high standards for student performance. Students have an active role in the process of assessment in a constructivist setting. They are responsible for participating in authentic tasks and developing and defending their personal views. Students who are active learners should participate in choosing products for portfolios with evidence of the different dimensions of learning that have occurred (Chaille and Britain, 1991). Authentic assessment in a constructivist learning environment pairs the student and teacher as a team that examines the new knowledge and habits of mind. These aspects of constructivism are not new ideas; teachers have been using many of these components in their classrooms for decades. Constructivists are simply pulling together ideas from a variety of teaching approaches and incorporating them into a new philosophy of successful teaching. Environmental educators have been experimenting with concepts such as discovery learning, cooperative learning, and problem solving for some time.

Conclusively, the existing four goal levels of environmental education are complex; students who make progress in reaching these goals should be rewarded. Jonassen (1991), students cannot demonstrate their skills of investigation, evaluation and environmental action through standardized testing. As Heibert and Calfee (1992) said, “Citizens in the 21st century will not be judged on their ability to bubble in answers on test forms’’. Constructivist teachers and environmental educators need to strive for development of alternative means for assessing higher level thinking skills. Jonassen (1991a) asks: “If the students are rewarded only for outcomes that are not facilitated by constructivist environments, are we not jeopardizing students by building them and engaging the students with them?’’. Project WILD, Project Learning Tree, and GEMS are excellent examples of curricula that share many of the goals of environmental education and constructivism. Save Our Streams is an example of an environmental organization that has been designed as educational activities related to a specific environmental problem. Although not all of the lessons in our review meet the four components of constructivism and four goal levels of environmental education, they meet many of the criteria. lessons can be designed to meet goals of environmental education for specific group of students and can include constructivism components. Professional educators should consider the components of constructivism when choosing instructional materials and planning instructional units in any subject.

In-service and preservice teachers need practice in using model constructivism curricula so that they can learn how to modify existing textbooks and curriculum guides. This may prove

difficult for teachers who follow the objectivistic philosophy because, according to Hewson et al, "Teachers' preconceptions about teaching and learning are not easily changed" Shymansk (2000). As Sarason said, "Schools cannot create and sustain the conditions for the development of children if those conditions do not exist for the teacher'' (Shymansky, 2004, p.771). Research in the use of authentic assessment activities and methods for lesson modifications would prove useful. We also believe that the most frequently used environmental education curricula should be evaluated to determine whether the goal levels of environmental education are being met. Therefore, using the Hack Mindset method in teaching CEI in Yaounde VI teachers will promote favorable environmental behavior in students which can help them solve future environmental problems using the start small approach (project base learning).

2.3.3: General perception of CBA teaching methods in education and CEI in particular

Teacher accountability is at the forefront of education policy. More specifically, legislation requires that teachers must collaborate more now than ever to ensure the success of a diverse population of students. The perceptions and attitudes of teachers play a pivotal role in achieving accountability.

Datnow (2011) discussed how teacher collaboration and camaraderie are essential components for school improvement. The researcher also revealed that teachers' attitudes toward collaboration were derived in part, by how collaboration was perceived by the local administration. The teachers participating in the study emphasized that positive peer pressure and not finger pointing had to play a role in facilitating the discussion for how to assist all learners. Mover, Todd (2012) discussed how three support teachers who displayed varying work habits to overcame obstacles that they faced within collaborative settings by committing to enhancing their own deficits and biases to meet the needs of their students. They accomplished this by gaining additional professional development and cultural sensitivity training.

Charles and Dickens (2012) showed that teachers often reported that there were many challenges when they were placed in co-teaching situations. By this, some teachers reported a lack of full administrative support, professional development, and a lack of committed scheduling time for collaboration. This all weighed heavily upon their decision to establish mutual trust and friendship with their co-teacher. Charles and Dickens provided tools and knowledge that would assist in providing teachers foundational avenues for improved collaborative experiences. This group of researchers placed emphasis upon the Common Core

State Standards Initiative which if implemented effectively provides a very clear path for all teachers to progress in a unified manner to assist a variety of students in excelling academically. The initiative also highlights the need for well-trained highly qualified teachers to build an ongoing rapport and communication unit for meeting the needs of students with exceptional learning needs. The introduction of web based technology was another tool highlighted by Charles and Dickens that can be used in order that collaborative teachers stay in constant communication even when time is limited. In a Georgia middle school, general and special education teachers expressed concerns about the challenges of working collaboratively in the inclusive classroom. Effective teacher collaboration is pivotal to ensure academic success of all students. The purpose of this qualitative bounded instrumental case study was to explore middle school teachers' perceptions and attitudes toward shared teacher collaboration in inclusion classrooms.

Lave and Wenger's (1991), situated learning theory was the conceptual framework. Purposeful sampling was used to select 4 general and 4 special education teachers who worked in middle school co-teaching classrooms. Face-to-face interviews and teacher lesson plans were the data sources. Teachers identified ongoing training emphasizing co-teaching models, collaboration, and classroom management strategies, co-planning periods, teacher selection guidelines for inclusion classes, and administrative involvement in collaboration as challenges of an optimal opportunities for working collaboratively. Based on these findings, a three-day professional development project was designed to effective ensure teacher collaboration and foster positive communication with administration teams. These endeavors may contribute to positive social change when administrators establish and cultivate a school culture of positive teacher collaboration between general and special education teachers involved in co-teaching, thereby improving teachers' co-teaching experiences and improving the academic environment for all learners.

The current trend in second language teaching in Cameroon is that of a shift from the Objective based approach also called the communicative approach to competency-based approach (CBA). This alteration should normally trigger change in the objectives, material designing and above all, the assessment strategies to reflect the new method. In the light of the above, this paper investigates the assessment tactics of teachers of the junior secondary school levels in a bit to check if it is in line with the competency-based assessment principles. It thus juxtaposes the theory of the competency-based assessment versus the practice in Cameroon.

According to Nicoline Agbor Tabe (2019) researcher opines that, the principles of a CBA assessment are not respected by most language teachers in Cameroon because of lack of knowledge and the difficulty in material designing and development. Through the use of a questionnaire administered to teachers of English, observation of past test and examination questions, observation of the logbook and interviews granted to some pedagogic inspectors, data has been elicited and analyzed. Findings revealed that the assessment tactics used by teachers do not reflect that required of the competency-based assessment. Rather, the judgmental policy continues to follow that of the objective based approach and thus structuralism and linguistic input is prioritized over functionality and usage required of the current methods.

2.3.4: Implementation Competency Based Approach (CBA) in education and CEI in particular.

According to Hodges and Harris (2012), Modern competency based education and training movements began in the United States of America when efforts were made to reform teacher education and training in the 1960s. Competence Based Approach (CBA) is currently an emerging concept in Cameroon educational system. The shift in teaching in Cameroon educational paradigm with a gradual move from Objective Based Approach (OBA) also called the communicative approach (CA) to the CBA over the years. Currently, the CBA is used in public secondary schools in the country.

According to Tabe (2019), this current trend from the OBA to the CBA should normally go alongside with an alteration of the syllabus approach, course objectives, material designing and more especially instructional material development which for many researchers like Henrichsen (1983) and Treffgarne & Mbaye (1993) recognized to be trivial and a problem area for teachers. As with any new concept, there is no one acceptable definition of this term under operation. The most important thing in the CBA is for the learner to be engaged actively in knowledge acquisition, skills development and professional behaviors that need to be demonstrated and practiced in a specific discipline.

According to Bashar (2013), CBA may also be viewed as Competency Based Education (CBE), Competency Based Education and Training (CBET), Competency Based learning (CBL), Competency-Based Instruction (CBI) and Competency-Based Programs (CBP). It can also be used interchangeably with the Performance Based Approach (PBA). Despite the different appellations of CBA, Garavan & McGuire (2001) acknowledge that the term “competence” has

no generally accepted operational definition. According to them, competence is "an action, behavior or outcome which a person should be able to demonstrate". This definition focuses on what a person can do (output).

Kirschner et al. (1997) view competence as the ability to choose and use the attitudes, knowledge and skills that are needed for a performance at a desired level. Kouwenhoven (2003) for his part sees competency as the capability to choose and use an integrated combination of knowledge, skills and attitudes with the intention to realize a task in a certain context while personal characteristics such as motivation, self-confidence and will power are part of that context. The National Post-Secondary Education Cooperative (2002) refers to competency as the combination of skills, abilities, and knowledge needed to perform a specific task. In spite the variation in the definitions, they stress the fact that competence is both a physical and an intellectual ability to do something well through repeated experiences. All these indicate that when implementing CBA in institutions of learning three aspects; knowledge, skills and attitudes have to be integrated together in all learning activities.

According to Savage (1993), CBA is a functional approach to education as it emphasizes life skills and evaluates mastery on skills, necessary for an individual to function proficiently in a given society. Such a shift has pedagogical implications as Rutayuga (2014) noted that CBA requires a shift from assessing a set of learning contents to assessing each learning outcome. Similarly, Wood (2008) insisted that the move towards competence based rather than content based approach necessitates student-centered teaching and learning.

The Cameroon Ministry of Basic Education (2004) had distinguished three main components of the competence to be taught: subject competence (knowledge), transversal competence (knowledge resulting from all the subjects in a child's learning) and life competence which results from the development of the right attitudes, behaviour, and problem solving skills for real life situations. Richard (2006) for his part identifies the nature of objectives according to the CBA. To him objectives are broken into narrowly focused sub objectives, so that both teachers and students can get a clear sense of progress.

Richards and Rodgers (2001) further opines that each approach needs specific teaching materials in order to realize the aim of its foundation. Therefore, for the implementation of the CBA to be effective, the instructional materials must be the ones that can motivate the learners and provide information in interesting way, bring the real life situation and cultural information to the classroom, supply learner with real exposure to the target language, and meet the needs

of the learner. The CBA advocates the learner-centered approach in which the learning process is central.

Field and Drysdale (1991) point out some of the aspects of a learner-centered approach such as the use of individualized materials, flexible learning time and continued feedback. In this regard, the implementation of CBA should ensure that all aspects of a learner-centered approach are included in the learning process. The Learning environment in the CBA is therefore directed towards the development of competencies at the end of any study program (Kirschner et al, 1997). In the CBA, the focus is to enable learners to master the knowledge, skills and attitudes needed for the world of employment and general life.

According to Rogiers (2004), the CBA relies on three fundamental objectives: firstly, to emphasize the competencies that the student must master at the end of each school year and at the end of compulsory schooling, rather than stressing what the teacher must teach. Secondly, to organize the learning outcomes in the best way so as to bring their students to the level expected. Thirdly to entrust the responsibility for learning to the student who has to build his or her own knowledge through means made available by the teacher.

According to Boutin (2004), the student becomes a learner who must suggest ideas first, have the desire to know and learn, organize work using new technologies, assimilating new learning methods, and looking for new information. The new role of the teacher consists in encouraging the learners to acquire the knowledge, which must be facilitated but not mechanically transmitted, and entrusting the preparation of certain tasks to the students. In CBA, a teacher is supposed to switch from the role of an expert who transfers knowledge to a coaching role of facilitating and guiding the learning process according to Biemans, Nieuwenhuis, Poell, Mulder & Wesselink (2004). This means teachers implementing this approach encourage learners to be creative, ensure the planning and organization of activities, and suggest ideas without imposing them on the learners. The teacher is required to be active in supporting the learning process rather than transferring contents.

According to Zineb, Soumia, Souad & Karim, (2017), in implementing the CBA, the teacher should use didactical approach that is based on the facilitation of active learning including group work, presentations and self-study. According to Anane, (2013), CBET or CBA demands a different approach to teaching and even assessment and certification. This is because conceptually, CBA is different from the traditional system. It is based on defined competency standards which are industry oriented and the education and training is more learner-centered.

This means that more emphasis is placed on the learner's role in the learning process than teacher-centered. Anane further highlights that the various facilitation methods that are employed for the CBET programmes are: direct instruction method, discussion method, small group method, problem solving method and that teacher acquire the knowledge of CBA through seminars, workshops and research.

Pauline P. Rwezaura (2016) investigated the implementation of competence-based English curriculum in Kinondoni municipal primary schools' in Dar es Salaam region. Her aim was to explore the extent to which primary school teachers implement competency based teaching and learning approach, to examine the availability of material inputs used in the teaching and learning process, to assess how the primary school teachers apply competency based teaching and learning approach; and to identify challenges encountered in the teaching and learning procedure for English subject. Pauline F. Rwezaura (2016) findings indicated that school inspectors, heads of schools and teachers were familiar with the concept of competency based curriculum. Pupils did not understand English language subject because they perceived it to be difficult. The teaching and learning method mostly used in teaching was the lecture method. Text books were inadequate compared to big class sizes. Many teachers were unwilling to teach the subject because they considered themselves to be incompetent. The main challenges encountered in the teaching of English subject included; inadequacy of teaching and learning materials, incompetent teachers and congestion of pupils in one class.

Competency Based Education (CBE) as an educational concept was introduced in USA 1970s. But because of different scholars or academics, CBE revealed a widely agreed meaning of its essential characteristics. Most importantly, the application of CBE characteristics has been made real in many teaching-learning programmes. But despite some of its limitations, it continues to be a highly relevant concept to for the teaching and construction of learners' skills, competencies, attitudes in the solving of future recent Environmental issues. Some selected definitions highlight these aspects since they provide an operational definition important for this research work.

2.3.5: Competency Based Education (CBE) and the application of the concept in teaching CEI in Geography

According USA Department of Education (2011) CBE, is an approach where students must demonstrate mastery of content to earn credit, to improve student outcomes and ensuring that students graduate with the skills and knowledge which they need to be ready for post-secondary

success. This reform was described as an “innovative approach and best practice”. It has become part of the “grammar of schooling” or standard policy in nearly all secondary and high schools, affecting all students, including those not pursuing higher education (Tyack & Cuban, 1995). Other researchers have argued that this type of new rigid structure is not the same as learning, does not serve all students effectively, and the time for students to achieve proficiency is limited looking at other context (Farbman, Christie, Davis, Griffith, & Zinth, 2011). Thus, to some critics and reformers, this approach has resulted in many students leaving high school without the skills and knowledge they need for post-secondary success. CBE is still recognizing as a new field with a small number of people and institutions understanding enough to describe it or implement it.

C-BEN’s (2017) focus their efforts on three main priorities which must be achieved in order that CBE movement is successful such as the growing demand, building capacity, and removing barriers. However, Burns and Hood (1994) findings revealed that investigations on competency-based curriculum practices and applications are very rich if put in action, but that main focus is on course design practices. Other research applications see studying within the context of competency-based teaching-learning as part of vocational training (Mulder et al; 2007), Information Technology (Cholin, 2005; Chang, 2006, 2007; Sampson et al 2017), or its impact on general education (Baines and Stanley, 2006; Biemans et al 2004).

Guskey (2005) in defining, see competency based as an educational movement that advocated and established educational goals in terms of precise measurable description of the knowledge, skills and behaviours which learners should possess at the end of a course of study. His definition of CBE is more focused on measurable relevant educational outcomes or goals. Meanwhile in that same light Gervais (2016) defines CBE as an outcome-based approach to education that incorporates modes of instructional delivery and assessment efforts designed to evaluate mastery of learning by students through their demonstration of the knowledge, attitudes, values, skills and behaviours required for the degree sought. Both definitions build an assessment tool to determine the extent that CBE exists in an academic program.

Castling Anne (1996), focused principally on the application of the concept of Competency-Based Education in the teaching and training fields. She concluded that competence-based teaching refers to the knowledge, skills, attitudes, behaviour and values a teacher needs to develop in order to become efficient in his teaching. Castling Anne (1996) further explains that this implies a very high standard, including complex skills such as planning, group animation

and classroom management, effective communication skills, evaluation of one's own teaching, flexibility, openness to learn from other people and respect for the individuality of each learner. According to her, as she posits, these attributes "make a teacher's teaching competence-based''. But before that, Onwuka Uga et al (1981) also view teaching as "the process of creating opportunities from which learners can gain experiences that will enable them acquire the knowledge, skills, attitude and appreciation that will serve as tool in life". Thus, in accordance with their view, CBE is a pedagogic approach in the teaching-learning transactions which has as objectives for teachers to show the abilities to inculcate in students or learners' skills, attitudes, and moral values during and after a lesson. This means teachers and students could use the lesson to discover their new skills which could help integrate them into the society and to solve real life situations in their society. This shows that the main objective of this new radical pedagogic approach is for development and shaping of both teachers' and students' perceptions, skills and behaviour during and after learning.

In this research work, the concept of competency-based education is highly viewed from the perspective of teaching CEI in Geography using Hack mindset teaching-learning approaches. Thus for competency-based teaching to be feasible under hack mindset approaches as a CBE teaching method, the teacher must ensure that his lesson answers the following questions adequately:

1. Has the focus of my CEI lessons moved from what my students know about the previous CEI lessons to what my students can do with it to significantly foster the environmental sustainability of their local communities?
2. Does the geography teacher to teach CEI lessons recognize that the above question is central for the teaching of CEI lessons and has important implications for curriculum framework, syllabus and teaching specifications, and assessment strategies?
3. The teacher to teach CEI lessons must asked ''what roles do environmental agents plays and what environmental skills learners need to acquire in order to accomplish their roles as future environmental agents?
4. How can the geography curriculum be organized to incorporate CEI such that learners acquire knowledge, attitudes, values, and skills, which can enable students to accomplish their roles as future environmental agents?
5. What methods and approaches of instruction could be used to make sure environmental skills are acquired during teaching-learning of CEI?

6. What are the learning outcomes that have been developed and written down clearly on contemporary environmental issues?
7. What are the conditions that have been established to enable and motivate both teachers and learners to achieve the essential environmental outcomes during CEI lessons?
8. Does the teacher to teach the CEI lessons define a series of short term objectives for a course, each building upon the one before so as to make learning advance in knowledge and skills?
9. How can assessment be carried-out to be ascertaining that learning outcomes actually happened during and after CEI lessons?
10. Do learners meet standards framed around objectives, explicated by descriptors and sample progress indicators?

Geography teachers' competences can be verified by the heads of geography departments, Pedagogic Inspectors in geography and experts in environmental studies as well as ministry of environment by using reports on interview schedules on knowledge, skills, attitudes, values, and practices related CEI in geography following competency based teaching-learning approaches. Self-Evaluation Questionnaires on the role of Geography teachers in secondary schools to use basic indicators for competency-based teaching during learning sessions base on Hack mindset approaches. Schedules on systematic Observation based on evidence gathered, can be classified into a file called a Portfolio of competency-based teaching (Julius. A. A, 2014). From all the above theoretical review, an operational definition of competency-based teaching of CEI using Hack mindset approaches in this work is thus; according to Ayuk. A. J. (2014) Competency-based teaching is highly efficient teaching made possible by the use of a wide innovative method and its approaches, skills, knowledge, values that catalyze the achievement of clearly stated educational potentials and outcomes on environmental issues. Reading literature on certain learners-centered teaching methods (LCM) and their related approaches, will be important to show how they are different from hack mindset teaching method which is the focused of this work.

2.3.6: The challenges of implementing CBA teaching methods in education and CEI in particular

Mahamat (2011) studied the implementation of CBA in some primary schools in Kousseri, Far North Region of Cameroon and realized that the approach is not being implemented effectively due to its novelty in the educational system and the teachers' indifference about the new visions

and new notion of competences. His student-respondents comment that most competences in their learning are irrelevant for their socio-economic insertion. He further states some of the challenges as follows; most teachers continue to use the explanation method, they display poor mastery of the method, the large class-sizes which impede the individualization of instruction and assessment strategies, and the lack of adequate didactic materials.

Aschcraft (1994) for his part reveals that the sources of challenges in implementing CBA comprise assessment and classroom management. Competency Based Approach is learner-centered; hence small class sizes are preferred to enable effective use of CBA facilitation techniques. According to Makunja (2015), the ideal CBA class size is between 40-50 learners. Currently in most of the institutions in Tanzania, the average class size is a hundred students and above which restrains teachers from attending to individual needs.

According to Samia & Nadia (2012), studied problems facing teachers in the implementation of the CBA in teaching Writing. They agree that there are difficulties in teaching Writing under the CBA as participants argued that teaching Writing under the CBA is a hard task. In addition, the teachers confessed that these problems touched them and they fell unable to overcome them because they lack sufficient information related to the CBA.

Makunja (2015), investigated the challenges facing teachers in implementing competence base curriculum in secondary schools in Tanzania and found out that teachers faced a variety of challenges that impeded the effective implementation of competence-based curriculum in teaching and learning especially lack of effective training on the use of the CBA.

Hatmanto, (2011) adds that the Implementation of CBA is ineffective because of lack of readiness among the learners and teachers. The ideal condition of CBC demands that both facilitators and students be ready to undergo the teaching and learning process in class, but in reality, the opposite condition happens. According to him, there are some students and teachers who are not ready to learn and teach respectively and this makes it difficult for the CBA to be fully implemented.

Another challenge according to Badan & Biklein, (2003) in Msuya, (2016) is that students attending the competence based curriculum class be proactive, unfortunately some students still maintain themselves as passive learners. In this situation, it becomes the teacher's responsibility to encourage them to be more active.

Garavan & McGuire, (2001) reiterate that the challenge comes from students being less "tuned in" in class whereas it is the responsibility of the teachers to stimulate the formers' meta-cognitive skills. From this context, it is clear that the shift from knowledge based to the CBA involves not only teachers to change their mind-sets but also students.

Hatmanto (2011), assessment is also a big issue faced by the facilitators during implementation of the CBA. It is more difficult to assess students' performance in the CBA class than in the conventional class. This might be as a result of the class size or better still the number of students per class. Hatmanto argues that in the conventional class, premium is given to the students' hard skills through the fixed mechanism of examination, but in the CBA, teachers have to assess both hard and soft skills of the learners. The issue of using students' assignments, projects, student-self assessments, portfolio, tests and examinations as the instruments for collection of student evidences on attainment of knowledge, acquisition of skills and attitudes seem to be a challenge to the facilitators. Hatmanto emphasizes that the hard skills of students can only be assessed through their learning tasks on daily basis which is really time consuming.

Jellema (2003), another challenge of implementing the CBA is on the side of the teacher's changing roles. It can easily be overlooked how much the role of teacher and student's changes, when CBA is implemented. In this paradigm shift, the teacher is supposed to switch from an expert role to transferring knowledge towards a coaching role and guiding students' learning processes. Students are supposed to take self-responsibility for their learning whereas the teacher becomes the facilitator. This requires totally different attitudes for both parties, perhaps even a paradigm shift. This challenge is related to professional development.

Anane (2013), holds that unless initial training and follow up assistance is provided for these facilitators on periodic bases, there is a tendency for teachers to teach as they were taught. In this case CBA trainers quickly slip back into the role of the traditional teachers. This is due to the fact that, it is the same teachers who handle the two systems: Traditional and CBA. Switching from one role to the other might pose a serious challenge for some teachers.

Wiysahnyuy. L. F. (2021), in Cameroon, after experimenting on the Objective Based Approach (OBA) and weighing its contextual inadequacies for many years, recourse has been made to another teaching approach, the Competency Based Approach (CBA). Teachers in secondary schools whether socialized or not in the approach are compelled to master and use it as a mode of instruction. The switch to this new teaching approach leaves some unattended questions. Are the teachers equipped and ready for the new approach? What are the challenges to meeting the

target objective of the approach? Based on these puzzling circumstances, this paper was designed to examine the various ways by which teachers acquire knowledge and skills on the use of CBA and the attendant challenges they face in implementing it. Her findings revealed that an appreciable percentage of teachers graduated from the training colleges before the CBA was introduced in the Cameroon school system. Majority (96.5%) attested to the fact that they acquired basic knowledge and skills of CBA through seminars, conferences and workshops which were not really frequent to keep them abreast with the dynamics in the art of the model. It was noticed that majority of the teachers found it difficult to implement the CBA because of inadequate knowledge and skills, overcrowded classrooms, limited teaching hours, the bogus nature of the syllabuses and insufficient pedagogic and learning materials. The study suggest that teachers need diverse professional development activities like in-service training, seminars, conferences, workshops, and individual research to continually appropriate, adapt and use dynamic trends of CBA. Although there exists rich literature on the CBA worldwide, its application in Cameroon is still wanting. From the state of the art in research on the CBA, it is evident that many researchers have attempted to clearly expatiate on what the CBA is, and some of the challenges to effectively implement it in the school system. On the basis of this, the study is aimed at finding out suitable CBA teaching method which geography teachers in secondary schools in Cameroon and Yaoundé VI municipality particular, can implement Hack Mindset as a CBA teaching method in enhancing the teaching-learning process in CEI as a section of geography, the challenges they face in implementing this CBA teaching method and way forward.

2.3.7: Problem solving teaching approaches in education and CEI in particular.

A reading of series of literature on the concept of problem solving teaching (PST) is related to CBE particularly because it focused on three key areas. Firstly, many scholars have defined problem solving in CBE using discovery teaching technique and enquiries to bring about innovation in the development of knowledge and skills in students as they engage in problem solving under CBE. Secondly, many inquiries models have been used to enhance students' knowledge on certain give topic which has help them to solve problems from series of experiences (MINESEC¬/SG/IGE/IP-SS/HE/GEO/JUNE 2014). In this section, we highlight the essential characteristics of the concept of PST relevant to this study.

A multiple of some examples of the definitions of the concept of PST include that of Oldridge. M. (2017) who defines problem solving teaching as ''teaching through problem-solving'',

rather than teaching about problem solving. According to him, broadly speaking, teaching through problem-solving is all that well defined and how constructivist teachers can teach math for students to be good at math in any problem-solving classrooms. The problem we are talking about is not what we called “mathematics problems” but a problem is something that gets students to thinking that sparks more questions about the important of mathematical ideas in real world situations.

Cai, J. & Lester, M (2010), had emphasis that ‘‘the term problem solving refers to mathematical task that have the potential to provide intellectual challenges for enhancing students mathematical understanding and development’’ It is important to understand that teaching is to taught through problem solving (Van de Walle,2007). That is, problem-based tasks or activities are the vehicle by which desired curriculum in any subject is developed. According to these authors, learning is an outcome of problem-solving process and working on problems allows us to access the CEI content, the curriculum, the ideas and concepts and skills we working on. Others see problem solving as a process of working through details of a problem to reach a solution and that problem solving may include mathematical or systematic operations and can be a measuring rod of an individual’s critical thinking skills (Business Dictionary, 2019 and Broadbear J. J. 2003).

Based on the above definitions and citations, we define problem solving characteristics and essentials according to 2014 Harmonized National Schemes of work of geography for secondary schools in Cameroon so that it meets objective of the study. It emphasis that problem solving method is one in which learners follow a well-defined sequence of problem solving steps such as identify a CDEI problem, collect information, analysis and interpret the data, develop possible solutions and draw conclusions. Generally, and according to some scholars, problem solving can be implemented using discovery and enquiries techniques in order to develop some certain competences which could help them draw conclusions on CEI in geography syllabus.

1. By Discovery technique students develop knowledge or skills as they engage in intentional learning through supervised problem-solving scientific method of investigation. In this regard, learner follows a well-defined sequence of problem solving steps which could be closed or open supervised by identifying a problem, collect data, analyze and interpret the data and propose possible solutions.

2. Inquiries or enquiries technique student search for testimonies and analyze information on a given topic and propose resolutions problem from experiences. It is therefore investigations and consequently becomes important for preparing learner's minds for eventual fieldwork. According to this techniques of problem-solving puts emphasis more on the process of investigating a problem rather draw conclusion of a problem in class or reaching a correct solution. Both techniques have no established pattern to followed, although they are flexible, systematic in implementation procedures. For example, inquiry technique is more of out-of-classroom observations and investigations based on the uses of instruments such as questionnaires, interviews during field trips so as to identify, work toward solution and established a solution.

According to (Hicks. T, 2006, 2014), many of us at our workplace have not had training in problem-solving approach. To him, most people are face with three things at workplace and when faced with a problem: They get afraid or uncomfortable and wish it would go away; feel that they have to come up with an answer and it has to be the right answer; and they look for someone to blame. To him people should instead learn how to welcome problem because it will always happen and needs our solutions. Base on this argument within the framework of CEDI some aspects of discovery technique is encourage in schools and inquiries carried out so as to look for solution of problems. However, the above teaching CBE methods do not show how the solution will be arriving at practically, meanwhile hack mindset approaches will go a long way to even use learner's skills to model their solution practically through start small approach for the case of CEDI in geography. Despite its limitations at a certain domain in problem solving approach, the 2014 Harmonized National Schemes of work of geography for secondary schools in Cameroon see this CBE method in geography as an important teaching out-classroom method since geography lies in the field. It also outlines certain competences to be developed by students so as to enhance CEDI in geography through hack mindset approaches. Students' fieldtrips experiences are based on real life situations which could enable learners gain the following life skills

1. Learners would acquire self-interest towards societal issues and real life situations
2. Learners develop divergent ideas but thinks orderly
3. Learners develop cause-effect skills such as arrange, classify, analyze, sort-out and interact with facts, with the ultimate goal of finding a logical answer to the specific problem
4. Learner acquire skills of thinking by themselves the problem at hand
5. Learner may develop a deeper mindset of societal problems

The fact this method of teaching lacks a purposeful activity in real life societal CEDI problems, this study also reviews closed related literature reviews to hack mindset or deeper learning which are well structured pedagogically following Bauwen and Hourcade (1994) Five P's of co-teaching. The Ps stands for Presence, Planning, Presenting, Processing and Problem solving. Project writing teaching method based on cooperative technique gives a clear picture of the different between other CBE teaching methods and hack mindset teaching method. This is because 21st century CEDI syllabus in geography should followed a more feasible approach towards the development of learners to write and proposed feasible model of solutions to problems to local, national and international stakeholders for implementation. Moreover, Lydia Even'a Luma (1983) holds that ''any goods and effective teachers vary their teaching approaches to suite their subject matter, needs and purpose of learners".

2.3.8. Project based teaching-learning methods in education and CEI in particular

A reading of Literature on the concept of project based learning (PBL) method is focused on cooperative teaching technique. According to Buck institute for Education (2019), under PBL-works says PBL prepares students for academic, personal, career success, and readies young people to rise to the challenges of their lives and the world they will inherit. By this, teachers' makes learning come alive for students. They students turn to be fully engaging themselves in solving a real world problem or answering complex question. Students demonstrate their knowledge and skills by developing a public product or presentation for a real audience. As a result, students develop deep content knowledge, critical thinking, creativity, and communication skills in the context of doing an authentic, meaningful project. PBL unleashes a contagious, creative energy among students and teachers.

According to the Gold Standard PBL model (2019) in action in New York, and looking for a more formal definition of PBL, defines PBL as a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic and engaging complex question or challenge. This is more of Project Writing Method according to 2014 Harmonized National Geography Schemes of work in Cameroon and defines it as, a ''purposeful activity or a meaningful unit of experience in a social environment carried out by individual or group''. This means the learner or group of learners is involved in doing concrete things. Therefore, both learner and teacher meet with the objective of learning by doing and taking initiative which could motivates learners to engage in learning experiences that contribute to becoming competent citizens. The aim of this method is to get

learners incorporates knowledge from different subjects to foster interdisciplinary a very relevant learner-centered teaching method in geography in general. It is either carried out using individual but more feasible pedagogic structure diffusing cooperative technique through group of learners.

A reading of Cooperative teaching literature in this section, highlight the essential characteristics of the concept of cooperative teaching relevant to this work. Some examples of the definitions of the concept of cooperative teaching include that of Adam Smith (1980) focused on language teaching, and Bauwnes' and Hourcade's (1991) on special Education. Adam Smith (1980) holds that cooperative teaching is a term used in describing small-scale collaboration between language and subject teacher.

According to Bauwens and Hourcade's (1991) cooperative teaching refers to a direct form of collaboration in which a general educator and one or more support service providers voluntarily agree to work together in co-active and coordinated fashion in the general education classroom. These educators possess distinct and complementary responsibilities in a sustained effort while working towards the common goal of school success for all students. Harmonized National Geography Schemes (2014), cooperative technique requires that mixed ability learners work together to accomplish a set of tasks.

The above definitions reveal two important facts. Firstly, cooperative teaching involves collaboration between two or more parties in view of achieving specific objectives. Secondly, many models of cooperative teaching are being practices in school systems around the world for different types of learners with the aim of increasing learning outcomes. In special Education classrooms, different cooperatives teaching models have been used by General Education teachers and paraprofessionals to help handicapped children or children with disabilities to attain outcomes like those without disabilities. For example, James M Walsh and Barbara Jones (2004) report on four alternatives models for co-taught classrooms that rely on flexible teacher schedules and the use of paraprofessionals. They reviewed the benefits of cooperative teaching in public schools of Anne Arundel Country, Maryland in the U.S.A on the basis of Parent, teacher and student surveys: academic outcomes data and classroom observations. The four models they report on include:

1. Collaborative scheduling A where a special Educator splits class time between two different classes;

2. Collaborative scheduling B where a special educator splits time between two different classes on different days of the week. The schedule is modified on the basis of the needs of team members;
3. Collaborative scheduling C where a special educator's schedule is set weekly on the basis of activities planned for each class. The special educator serves as a resource for the team and does not have a rigid schedule;
4. Collaborative scheduling with a teacher assistant, representing the special educator in co-taught classes as directed.

These models show that co-taught settings can result in improved outcomes for all students. Furthermore, students in co-taught classrooms enjoyed school more, learned more, felt better about themselves in the general education classroom setting, James M Walsh and Barbara Jones (2004, p.19).

In contrast to dessert project, PBL requires critical thinking, problem solving, collaboration, and various forms of communication so as to answer the driving question and create high-quality work, students need to do more than to remember information. They need to use higher-order thinking skills and learn to work as a team. To help ensure your students are getting the main course and are engaging in quality Project Based Learning, PBL Works promotes a research-based model for "Gold Standard PBL." The Gold Standard PBL model (2019) draws students from different levels, towns and schools in Britain. The project features teacher Rayhan Ahmed at Leaders High school in Brooklyn in New York with his 11th grade chemistry class, the project also features teacher Kimberly Head-Trotter of Mckissack Middle School, in Nashville in the Month March with her 6th grade Elementary History class and then features teacher Cheryl Bautista of Katherine Smith Elementary school in San Jose with her third graders. This model, provide us with two useful guides to any educators

1. Seven Essential Project Design Elements which provide a framework for developing high quality projects for your classroom. These seven essential project design elements are; reflection, critical revision, consult public product, question challenging problem or question, sustained inquiry, check it authenticity, ensure student voice and choice. The learning goals are key knowledge, understanding, and success skills.
2. Seven Project Based Teaching practices to help teachers, schools and organizations to measure, calibrate, and improve their practice. These seven essential project design

elements are; Design and plan, align to standards, build the culture, manage activities, Scaffold student learning, and asses' student learning, engage and coach.

The gold Standard PBL model aligns with the High Quality PBL Framework. This framework describe what students should be doing, Learning, and experiencing in a good project. The limitation of this cooperative teaching pedagogically limits student within school's environment rather than creating a co-participatory approach or collaborative situation where students actually develop project on their own and propose partnership with Government, local, NGOs and Organization institutions for solving pressing CEDI issues in geography. Other interesting cooperative teaching models are example provided by Morray (1980), Hansen and Van Hammen (1980), Gee et al (1984), de Escorcia (1984), Adam Smith (1980), Jackson and Price (1981), Johns and Dudley Evans (1980). Proponents of cooperative teaching contend that for efficient learning outcomes to be attained, some basic requirements must be met. Bauwen and Hourcade's (1984), Arnold (1998), Johns Dudley – Evans (1980) Skehan (1980) and Ivanic (1980) have all advanced interesting suggestions that have been exploited in the formulation of this study.

Bauwen and Hourcade's (1994) conceptualized what they termed the Five P's of co-teaching. The Ps stand for Presence, Planning, Presenting, Processing and Problem-solving. In their view, Presence means that co-teaching requires a time commitment on the part of the teachers and is treated as a part of each teacher's daily schedule. Planning means the teacher program planning times and as such planning should occur at the course, unit and lesson level. Furthermore, they hold that decisions about which teachers will participate in co-teaching, what courses will be best served by co-teaching teams and time set aside for teams to make instructional plans constitute planning. During planning, advice should occur regularly so that students' concerns can easily anticipate other problems. By Presenting, they explain that, it is important to consider both teachers' skills and expertise in planning how contents will be presented to the class. And these to them means careful preparation that must ensure both teachers are engaged in the teaching process. They further explain that there are a variety of models that can be utilized to allow teachers to work together in presenting or delivering the contents. Both teachers may share time in front of the class dividing lecture time, interjecting examples for another, or having one teacher is lecturing. Teachers might also divide the teaching time by taking turns monitoring the students in the classroom and assisting students, who are struggling. Teachers should show mutual respect for one another and utilize the talents and abilities of one another to best serve the students in the classroom. The fourth 'P' stands for processing. They argue

that it is important for teachers to meet often to process concerns they have in the co-teaching relationship. In their view, differences in teaching styles and philosophies can become concerns if not discussed regularly. That is why, they strongly advice that teachers should create an environment in which these concerns can be addresses openly and differences are respected. Bauwen and Hourcade's (1994) finally posit that Problem Solving the fifth 'P' for successful problem-solving, namely:

1. Discuss specific student concerns and make alteration in learning strategies and behaviour plans;
2. Solutions should be regularly evaluated and modified to meet teachers' and students' needs.

Bauwen and Hourcade's (1994) suggestion appear brilliant but a realistic evaluation of each context of application of the five "P" is absolutely necessary if success must be achieved. Such an evaluation must seek to find out the number of qualified teachers who can be involved in cooperative teaching. In addition, the establishment of a comprehensive profile necessary for teachers to be involved in cooperative teaching projects is a second necessity. The rationale for such a profile is to ascertain that cooperating parties possess the expertise necessary to make expected outcomes happen. Above all, the experts must have a strong personal believe and declared willingness in cooperative teaching, as well as fine communication and consulting skills which are the bases for good interaction management.

Arnold (1988) argues the case for relinquishing traditional autonomy. In his view, "it is absolutely crucial that both the subject specialist and the Geography teacher be prepared to give up some of the autonomy which has traditionally been held to be theirs', Arnold (1988, P. 7). "Each needs the advice and guidance of the other and will never be truly effective without it", Arnold holds.

According to Jonhs and Dudly-Evans (1980), the recognition of a common problem by collaborating parties and the setting-up of a clear framework agreed in advance for a pattern of activities, as well as the definition of responsibilities on each side, is the first condition for effective and efficient cooperative teaching. In addition, they suggest that reduced intrusion of the subject teacher must be the rule. An after suggestion they make is that the group of students in a collaborating teaching enterprise must be homogenous in terms of language level and specialism for substantial learning outcomes to be attained.

Despite of some of its limitations, cooperative teaching has overriding advantages. It combines the strengths and resources of two or more professionals which support instruction and classroom management while allowing more opportunities for the professionals to reflect, shape input, process input, monitor, assess, adjust and adapt instruction based on the context. Moreover, learners will acquire all the skills from other learner-centered methods, learner and teachers will develop interpersonal relationships, build-in resilience, assiduous spirit and positive attitude towards issues and people. According to this research work, cooperative teaching means more of shared instructional responsibility, mutual accountability, pooling local resources at a large scale between Geography Teachers in secondary schools and all experts from diverse domains, that is shared interdisciplinary instructional responsibility between resource persons who are willing and capable of contributing passionately to the efficient preparation of students in playing significant environmental and developmental roles that can foster the development of their communities base on values acquired during CEDI Lessons especially when they leave school (Ayuk .A. J,2014. Pp. 48).

2.4: CONCEPTUAL FRAMEWORK ON HACK MINDSET TEACHING METHOD.

Much has not been documented on Hack mindset teaching method in teaching CEI in Geography and teaching in general. The implementation of Hack mindset as a CBA teaching method in teaching CEI in geography the case of Yaoundé VI in particular will be added findings in the field of teaching and the teaching of environmental issues. This section looks at a number of concepts of mindset: Carol Dweck's concepts of Fixed mindset and Growth mindset in the early 1970.

Research has shown that when students approach their school work and other pursuits with a positive or growth mindset, they get better results. We will be talking a lot about Growth mindset in this section. Dweck (1970), wants you to call on your positive growth mindset when you are taking on a hard challenge, solving a really difficult problem, or when you feel like you want to give up then shift from a fixed mindset to a growth mindset. This because all teachers and learners from the word go, have a mixture of both mindsets: fixed and growth mindsets. Thus, Carol Dweck had the opportunity to share personal examples of situations in which there is a fixed mindset and growth mindset.

In the early 1970s, psychologist Carol Dweck was studying how children responded to failure. Dweck and her research team devised an experiment involving difficult math problems that would allow them to gather data on how the children responded to failing a challenge. Dweck

discovered that some students had a complete inability to cope with their failure. Dweck discovered that some students approached the difficult task with the distinct attitude of wanting to learn from it and to challenge and grow their intellect. He wondered what might cause these different reactions in children faced with challenges. This experiment was the beginning of Dweck's research into the mindsets. Dweck coined the phrases fixed mindset and growth mindset to describe the way some students avoided challenges and others approached them head on.

2.4.1: The concept of Fixed Mindset

Fixed mindset is the belief that intelligence and other qualities, abilities, and talents are fixed traits that cannot be significantly developed. We sometimes refer to this as the God-Given Talent Theory the belief that you are born with only so much skill or ability in certain areas and there isn't much you can do to change that. According to this mindset, some people just have talent for things that others do not. Dweck coined the phrase fixed mindset to describe the way some students avoided challenges, how some students give up easily in front of obstacles, how students see effort as fruitless or worse, how students ignore useful negative feedback and feel threatened by the success of others. As a result, they may plateau early and achieve less than their full potentials. All this confirms a deterministic view of the world. According to this concept, geography teachers with their Objective Base Approach tendency has a fixed mindset perception in the implementation of CBA teaching methods like Hack mindsets in teaching Geography and CEI in particular, the case of Yaoundé VI Municipality.

2.4.2: The concept of Growth Mindset

On the other hand, growth mindset is the belief that intelligence and other qualities, abilities, and talents can be improved with hard work, effort, perseverance and dedication over time. Over decades of research, Dweck and her team amassed data that definitively showed that people who possessed a growth mindset had better outcomes in academics, careers, relationships, and other facets of life. According to this concept, students are able to embrace challenges, persist in the face of setbacks, see effort as the path to mastery, learn from criticism, find lessons and draw inspiration in the success of others. As a result, they reach ever-higher levels of achievement. All this gives them a greater sense of free will.

In the Growth Mindset Coach and the Growth mindset lay book, Dweck outlined a series of steps teachers can take to create a growth-oriented classroom. A growth-oriented classroom

focuses on growth over grades and progress over performance. In this type of classroom environment, we reasoned students' growth mindsets would have the best chance of flourishing. In her educational talk, he believing on the fact ''You Can Improve''. Dweck asks, how are we raising our kids? Are we raising them for now instead of yet? Are we raising kids who are obsessed with getting as? Are we raising kids who don't know how to dream big dreams? Their biggest goal is getting the next A or the next test score? And are they carrying this need for constant validation with them into their future lives? If we want to raise kids as Dweck described for yet instead of right now, we must offer them spaces where they see the positive association between effort and growth.

In a classroom, this begins with you, the teacher. no matter how much you teach and encourage growth mindset as a classroom teacher, you may be sabotaging it with your own fixed mindset. It is imperative that you approach each day, each interaction, with a growth mindset, always viewing your students and their potential through the lens of growth and modeling growth mindset daily. Dweck writes in her book mindset, a person's true potential is unknown, it's impossible to foresee what can be accomplished with years of passion, toil, and training. Top viewing your students through the lens of your preconceived notions, instead approach each day with the belief that with hard work and perseverance your students even the ones who struggle most have the potential to achieve great things. His belief will propel both you and your students to embark on the growth mindset journey. If students understand that you believe in their unlimited potential, it sets the stage for them to believe deeply in their own abilities.

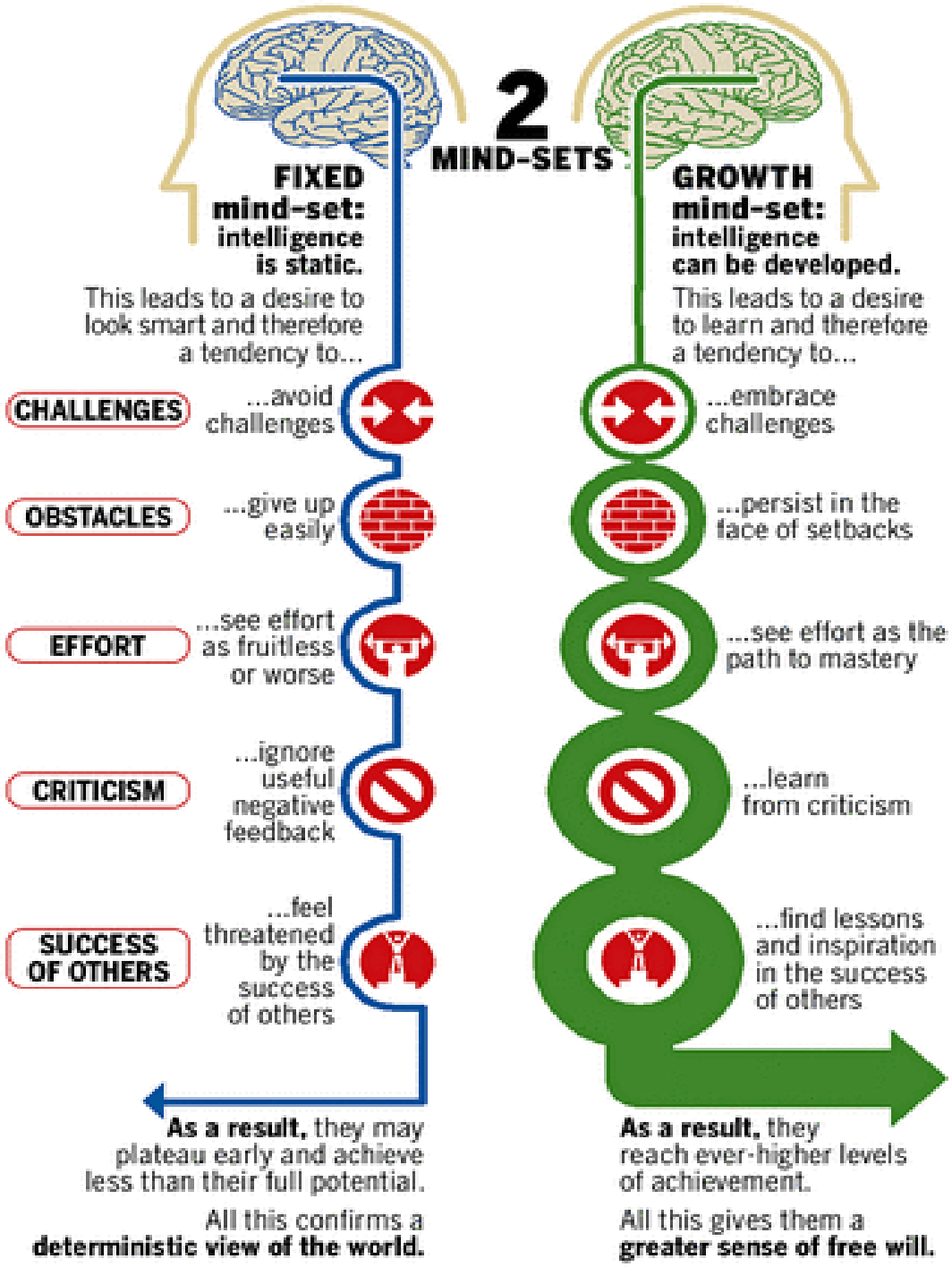

Figure 2.6: The concept of mindset and Hack mindset teaching method.

Source: Carol S. Dweck et Nigel Holmes (2014)

The goals of the growth mindset classrooms are to develop in each student the love of learning. This is not an easy challenge because, students come to us with a range of obstacles, with learning disabilities, lagging skills in behavioral development, difficult home situations, trauma, chronic absenteeism, a lack of family support and a variety of other. These difficulties

may impact their availability for learning and their academic performance at school. As teachers, we are responsible for seeing each student for who they are, to build relationships with them, and to set them up for success by helping them understand the connection between effort and improvement, regardless of circumstance.

With a growth mindset concept, geography teachers within a competency base approach should developed a progressive mindset and positive perception in the implementation of Hack mindsets as a teaching method in teaching Geography and CEI in particular, the case of Yaoundé VI. The concept of mindset is illustrated in figure 2.4. The objective of reviewing the concept of mindset in this study is to show its relationship to the hack mindset method in teaching environmental issues in geography. Other ideas conceptualized as fostering mindsets in the classroom include the following: praising students for efforts made, seeing mistakes as normal in a learning session, creating a culture of feedback and looking at others work with a critical eye as a path to improvements and soliciting parents to promote a growth mindset at home.

2.5: THE RESEARCH HYPOTHESIS

The main study hypothetical proposition emphases, on the use of Hack mindset teaching-learning method to teach CEI lessons in geography within secondary schools in Yaounde VI Municipality so as to improve on the knowledge, skills, values and attitudes in transforming learners into veritable agents in identifying and resolving future environmental problems in their respective communities. The study is entitled**,** "Teachers' perceptions on hack mindset teaching-learning method approaches in teaching CEI in Geography within secondary schools in Yaounde: Case of Yaounde VI Municipality".

Three specific research objectives guided the formulation of three research hypothesis. They are designed to provide answers to the research specific questions and objectives:

- Ha1: Geography teachers are having a positive perception about the use of Hack mindset teaching-learning method in teaching CEI in geography in secondary schools in Yaounde VI Municipality.
- Ha2. The major challenges for implementing Hack mindset teaching-learning method in teaching CEI in geography are related to inadequate didactic resources and technical knowledge in secondary schools of Yaounde VI Municipality.

- H3. Sustaining education system is regarded as the most sustainable solution to be adopted for the effective used of Hack mindset method in teaching CEI in geography within Yaounde VI Municipality.

2.6: DEFINITION OF VARIABLE AND INDICATORS

The research has both independent variable and dependent variable and series of indicators which specify the type of operations necessary for their measurement. The research study conducted with a scientific approach is focus **on two main sets of variables** which are Hack mindset teaching method and Geography teachers' perceptions. The first set acts as a constant or independent variable (IV) is the **''Hack mindset teaching method''** which shall be used to measure the differences of the second set or the dependent variable (DV) which is **''Geography Teachers' perceptions''**.

2.6.1: The Main two variables of the research topic

- **Independent variable (IV)**

Hack mindset teaching method corresponds to phenomenon which the study wishes to investigate. This is because Hack mindset is CBA teaching methods with three main approaches which can be apply systematic by geography teachers in teaching CEI in Geography.

- **Dependent variable (DV)**

Geography Teachers' perceptions correspond to all actions to be measure by the study. It will measure the different attitudes teachers have in using the Hack mindset teaching method in the teaching of CEI in Geography within the Yaounde VI in Cameroon.

2.6.2: The Research variables and indicators for each research Hypothesis

The indicators that was used to manipulate the main independent and dependent variables are related link to perceptions, challenges and pedagogic options.

Hypothesis 1: Geography teachers are having a negative perception about the use of Hack mindset teaching-learning method in teaching CEI lessons in geography in secondary schools in Yaounde VI Municipality.

- The independent variable is the knowledge on **Hack mindset method** while the dependent variable is the knowledge of on **Geography teachers' perceptions** the use of Hack mindset.
- The main indicators are on the attitudes and behaviours such as it time consuming, is it complex when comes to learners' expectation, a negative or positive perceptions when it comes to implementation low or high level

Hypothesis 2: The major challenges for the implementing Hack mindset teaching-learning method in teaching CEI lessons in geography within schools in Yaounde VI.

- The independent variable is the knowledge on Hack mindset method while the dependent variable is the knowledge of on types of challenges face by Geography teachers the use of Hack mindset.
- The main indicators are on values such as commitment, cooperation, love, hard work and sacrifice of using the method despite the numerous challenges identified.

Hypothesis 3: Pedagogic options adopted by teacher as main stakeholders contribute more in the use of Hack mindset teaching-learning method in teaching CEI in geography than the challenges to be faced in secondary schools in Yaounde VI Municipality.

- The independent variable is the knowledge on **Hack mindset method** while the dependent variable is the pedagogic options adopted by teachers on the use of Hack mindset.
- The main indicators are on skills such as planning process, interpreting teaching methods and approaches, identify appropriates realistic time bound objectives and ensure and effective implementation of the methods

2.6.3. The research strategy

The research strategy of the study, shows how the researcher structured its study. This section of the study shows how research questions are transformed into research objectives, hypotheses and the related chapters of the study that result from the questions, objectives and the hypotheses (Table 2.1 The synoptic Table).

Table 2.1: The research strategy of the study

Research questions	Research objectives	Research hypotheses	Chapters
RQ1 What are the perception of Geography teachers about the use of Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?	**R01** To examine Geography teachers' perception about the use of Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?	**RH1** Ha2.Geography teachers' have negative perception about the use of Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI	**Chapter Four:** Operationalization of Hack mind set 4.0: Introduction 4.1: Evaluation of geography teachers' perception on the use of Hack mindset method Teaching in CEI in Geography within Yaounde VI.
RQ2 What are the challenges faced by geography teachers in implementing Hack mindset teaching-learning approaches in teaching CEI lessons in geography within secondary schools in Yaoundé VI?	**RO2** Investigate on the Challenges faced by geography teachers in implementing Hack mindset teaching-learning approaches in teaching CEI lessons in geography within secondary schools in Yaoundé VI?	**RH2** Ha3.The major challenges of implementing Hack mindset teaching-learning approaches in teaching CEI lessons in geography within schools in Yaoundé are due to inadequate didactic resources.	**Chapter Four: General conclusion** 4.2: Geography Teachers perceptions in the teaching CEI in Geography using Hack Mindset method. 4.3: Major challenges of implementing Hack mindset method in teaching CEI in Geography. 4.4: Pedagogic Options adopted for full Implementation of Hack mind set approaches in Teaching CEI in Geography.

RQ3 How effective can Geography teachers use Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI?	**RO3** To investigate how effective can geography teachers use Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI	**RH3**. Ha1.There is a low level of application of Hack mindset teaching-learning method in teaching CEI in geography within secondary schools in Yaoundé VI.	**Chapter Five** 5.2: Conclusion on finding of Implementing Hack mind set approaches in Teaching CEI in Geography 5.3: Recommendations

Source: Adopted by Author from Passi, 2018.

Table 2.1 shows the research strategy for the study. It shows how research questions are transformed to research objectives. From the research objectives research hypotheses are derived and from the research hypotheses the corresponding chapters are formulated. That is research questions one and two gives rise to research objectives one and two. From research objectives one and two, research hypotheses one and two is derived which leads to the formulation of chapter four and its sub headings. The research question three then gives rise to research objective three. From research objective three, research hypothesis three is derived which leads to the formulation of Chapter five and its sub headings. The research strategy refers to the plan for the study. It provides guidelines which direct the researcher towards solving research problems.

2.7: Conclusion

This chapter discusses the theoretical frameworks and concepts on which this study is based. Besides these, a review of the literature related to the issue under study has been made. This chapter also deals with the formulation of research hypothesis, definition of variables and indicators. This chapter ends up with a synoptic table on study strategy or plan of work.

CHAPTER 3
THE RESEARCH METHODOLOGY OF THE STUDY

3.0: Introduction

As earlier mentioned in the previous chapters, this study examines the perception of geography teachers on the use of Hack mindset method in teaching CEI in 13 private and Governments secondary schools in Yaounde VI Municipality. In order to undertake this research work, we were guided by theoretical frameworks, as well as a research methodology. In this study, the research methodology involves the various techniques, methods, used in the process of research in order to make the research work more scientific. This chapter presents the methods and procedures for collecting data. Thus, this chapter is subdivided into seven sections; Type of research design, setting of the population, population of study, instruments of data collection, method of data collection, method of data analysis, difficulties encountered.

3.1: Type of Research Design

This study is a descriptive survey in which a frequency count was made. According to Isaac and Michael (1997: 136), a survey is a research method used to answer questions that have been raised, to solve problems that have been posed or observed, to asses needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time, in what amounts, and in what context. making it a qualitative research. The study is more of a mixed research; it combines quantitative and qualitative research. Kraemar (1991) as cited by Ayissi (2021) establishes three key features of survey research like this one. The three key survey research features for this study include;

Firstly, the fact that the survey research is used to quantitatively describe aspects which are specific to a target population of geography teachers. Also, that the data was collected directly from the source which was the teachers. The third feature was based on the fact that the findings gotten from the selected portion of geography teachers can be generalized to the entire target population. This study therefore is concerned with examining how geography teachers in secondary schools, in Yaounde VI Municipality perceived the use Hack mindset in teaching CEI in geography.

It also tries to find answers to problems that are not clear to Geography teachers in CBA teaching methods in the area of teaching CEI in Geography using the study ‘‘Teachers’ Perceptions on Hack Mindset Method in Teaching Contemporary Environmental Issues in Geography in Secondary Schools in Yaounde VI Municipality’’. Thus, the main purpose of this type of exploratory research is to give an objective clarification and realistic description of what exists and what could be improved in the field of teaching CEI in Geography using Hack mindset method. So using qualitative and quantitative approaches to better the situation in the field is considered the most flexible and extensive research method.

3.2 Area of the population

The study is carried out in 02 Government Bilingual High School (GBHS) and 11 English Speaking Privates Schools (ESPS) in Yaounde. The secondary schools are situated in the Centre region, Mfoundi division, Yaounde VI subdivision. The schools were selected from 12 neighborhoods namely: Biyem-Assi, Etoug-Ebe, Mvog-Betsi, Obili, Melen, Mendong, Simbock, Nkolnzie, Jouvence, Nkolbikok I and II, Elig-Effa and Zibi. From these neighborhoods only English speaking schools were located and randomly selected based on school proximity and the number of GBHS and ESPS. The Geography teachers selected secondary schools in Yaounde VI Municipality are mostly Cameroonians, and have English as their first choice language in the Anglophone sub system of education, whereas French is a foreign language. However, secondary schools in Yaounde VI Municipality does not only limit its Geography teachers to those of Cameroonian nationality, some of its teachers are foreigners.

3.3 Population of study

The population of the study constitutes secondary school Geography Teachers of Cameroon. The researcher studied the perception of teachers on the use of Hack mindset method in teaching CEI in Secondary Schools in Yaounde VI Municipality, of the Anglophone sub system of education, as a sample. This sample concerns geography teachers who teach Form 1 to Upper Sixth arts oriented. The total number of geography teachers whose perception were sampled were selected at random for this study is 79. The sample population therefore comprises of seven respondents.

3. 4: Sampling

In this study, random sampling is the technique that was used. According to Bhardwaj (2019) sampling has to do with selecting a sample from individuals or a target population that will represent the entire population under study. This means that in this work, part of the population under study has been chosen as respondents and they represent the entire target population. Geography teachers teaching Form one to upper sixth in Secondary schools in Yaounde VI of both Arts and science oriented have been chosen as respondents. After collecting the questionnaires, they were mixed in any order and seventy-nine were chosen at random

3.5: Data collection and instruments

This section of the work focuses on the type of data that was collected and the instruments used. Data for this study were collected from secondary sources using related written documents, schools and institutions record documents, search engines and other sources. Primary data were collected from many raw sources and the instruments use to collect data were: interview guides, questionnaire, Cameras and Global Positioning System.

3.5.1: Secondary data

The secondary sources of data were collected from already stored information from scheme of works, syllabuses, topographic maps, previous related work done in the area, articles, journal and periodicals, internet sources, as well as documentations and libraries. Reports of both Governmental and Non-Governmental agencies and institutions related to environmental studies were also reviewed. Also schools' records, website and archives were also consulted to collect data on enrollment, number of geography students, number of teaching staff employed, teaching aids, class-rooms and year of creation (existence). This research made used of all these types of data with respect to the objectives of the study.

3.5.1.1: Documentation and libraries.

After the formulation of the topic the first step was to use the internet to obtain what others have written in other parts of the world in teaching environmental problems in general as well as to read on recent documents related to the topic. The aim was to obtain online dissertations, articles and journals related to the topic. This was done with the aid of search engines such as Google. The libraries of the universities of Bamenda, Buea, and Yaounde VI, Department of Geography and that of the department of Didactics in the University of Yaounde I faculty of

Education were consulted. Much information was obtained in the teaching of environmental issues around the world with little in the use of Hack mindset. The main reasons of consulting these sources were, for the researcher to obtain the information which was useful in:

- This permitted us to obtain information used to construct the following: general introduction and framework of the study, literature review, conceptual and theoretical frame work of the study.
- It also permitted us to obtain information on related topics link to teaching methodology in general and environmental issues in particular.
- The information obtains from other literature reviews related to teacher's perception in teaching environmental issues around the world help us not deviate from the study main objective.

3.5.1.2: Consulting Institutions

Some institutions necessary to provide information for this study were consulted. Some of the institutions include: Divisional Delegation of secondary education, Government and Private secondary schools in Mfoundi Division were consulted. Also, the institute of land tenure and Divisional Delegate of Environment and Nature Protection in Mfoundi Division were also consulted. This provided information necessary for us to meeting up objectives two and three of the research. The main reasons of consulting these sources were, for the researcher to obtain the information which was useful in:

- This permitted us to obtain information on the total number of schools under Yaoundé VI so as to determine the sample schools.
- This permitted us to obtain our sample size for the study and to determine the number of questionnaire to be administered in each school.
- It also, permitted us to obtain the based map of Yaoundé VI from which we were able to realize the study location map and the sample size map for the study.
- It permitted us to be updated with the new changes in Geography syllabus and scheme of work so as to master the teaching methods and approaches integrated in the subject.
- It also permitted us to understand the organization of CEI in the teaching content of Geography from form one to upper sixth.

- Finally, this permitted us to consult some vital school record documents and web sites from which data on number of staff employed to teach Geography, number of students offering Geography, total school enrollment year of creation and others.

3.5.2: Primary data

The primary sources of data were collected from secondary schools' educational stakeholders with Geography teachers as the targeted main resources persons. This was only possible via field observations, interviews, focus group discussions and administration questionnaire. This area of the study provided us the opportunity to carry out direct observation and as such permits the researcher a personal apprehension of the problem. The collection of primary data in the field was carried out in four phases.

3.5.2.1: Preparation and use of instruments

The instruments were tools used in obtaining vital information needed for the study. These instruments include field survey and observations, interview guides, focus group discussions as well as administration of questionnaire.

- **Field survey and observations**

The study began with a field survey of Yaoundé VI Sub-Division. This gives the researcher a picture of the educational community of the study site. The major Government and private schools were sited in order to determine the sample size of schools to be selected. Also pictures and geographical coordinates were taken alongside field survey. These survey phase of the study provided us with information and a base map of Yaounde VI Municipality. The information was use produce a spatial distribution map of 13 major secondary schools from where the research was carried out.

- **Interview of resource persons**

By resource persons are educational stakeholders, we deem competent to provide information by virtue of their positions necessary to achieve the objectives of the research**.** Besides field survey, interview technique was also used to collect vital information on issues related to teaching of Geography as a whole and CEI in particular. This was done with the used of an interview guide structured according to the research objectives. The resource persons contacted were: The Divisional Delegates of secondary education and Geography inspectors' secondary

education, Doctors in the didactics, school administrators in both Government and private schools, heads of department (HODs) in Geography were interviewed (Table 3.1).

The Schools principals were interviewed because they constitute the main authorities that understand the challenges teachers will face in teaching CEI using Hack mindset teaching method. All these personnel provided information with respect to the various objectives.

Table 3.1: Distribution of interviews

Nº.	**Respondents**	**Number**
1	Geography inspectors'	**03**
2	Dr. in the didactics	**01**
3	Schools Principals	**05**
4	HODs in Geography	**05**
5	Retired Teachers	**05**

Source: Field Survey, May 2021

These opinion leaders in relation to the study were selected randomly taking into consideration the longevity and experience in the field of didactics and the teaching of CEI in Geography. The main aimed was to meeting up with the following:

- ✓ To be familiar with the topic
- ✓ To be aware of recent changes and updates in the teaching of CEI and Geography content as a whole.
- ✓ To ensure interdisciplinary aspects and focus with the limits of the study

- **Focus Group Discussion**

This was another method of collecting primary data in the field. It was carried out in the different schools randomly selected and was mostly done during workshops, seminars and teaching events. The brainstorming techniques were applied and during this process, a small question served as a trigger to discussions which were mostly on the new CBA teaching methods and how their approaches can be feasible in the teaching of Geography as a whole and CEI in particular under Hack mindset method. Other area of discussions was on challenges in the application of such teaching approaches in CEI. The participatory approach was privileged and ideas initiated by participants were taken into consideration and noted in a note book.

3.5.2.2: Administration of questionnaire

The used of questionnaire as another instruments for primary data collection was also vital. Questionnaire administration was done with regards to the following; the large surface area of Yaoundé, number of schools in Yaoundé VI Municipality, number of schools offering only English sub system of education, the distance of each school from the other, number of students offering Geography from Form one to upper sixth in each school, number Geography teaching staff in each school in the study area and their year of creation. From these considerations, Schools were selected within from which the sample size of the study was obtained using two main techniques. The purposive random sampling and systematic stratified random sample survey were used to select the sample schools to which the questionnaires were administered.

- **The purposive random sampling technique**

This technique was used to determine sample schools. It was purposive because the spatial delimitation of the study, made mention of the fact that the study will target only English sub system Government and Private Bilingual schools within the Yaoundé VI Municipality since Yaoundé was too large for the study. Finally, this technique was chosen to ensure wide spread representativeness of all the English speaking schools such that the English section in each Bilingual school could have a chance of been selected. From total of 59 schools (2020) both English and French speaking schools in Yaoundé VI Municipality, 27 schools were deducted from the 59 schools as the sample site. Out of the 27 schools, 15 schools were purely English speaking private schools while the remaining 12 schools were made up of 02 Government Bilingual schools and 10 Bilingual Private Schools. It is from these sample schools of 27 in number that the sample population was selected using a systematic stratified random sampling technique Table 3.2.

- **The systematic stratified random sample technique**

This technique was also used in the select of the sample schools to which the questionnaires were administered as the sample size. According (FCMDD, 2020), Yaoundé VI Municipality, has total of 59 secondary schools (English and French) which out of these 59, 27 offers the English sub system of education (Table 3.2). Using the systematic stratified random sampling technique, these 27 schools were stratified into two groups that is A and B respectively. This was done based the number of years the school has been operating or in existence within Yaoundé VI Municipality. Schools of more than 05years falls in group A called old schools which were 12 in numbered and those less than 5years as group B called new schools in 15 numbered. Within each group, the random sampling technique was used to obtain the study

population size with more focus on the number geography teachers in each school. To give a true representation of the field, schools of more than 05years with more than three geography teachers were highly considered. 14 schools with 79 geography teachers (2020) standing as the study population were selected from the sample schools Table 3.2:

Table 3.2: Sample schools Within Yaoundé VI

Nº	Name of schools	Years of existence in the field	Group	Section of education	School status
1	Lycee Bilingual Etoug-Ebe	> 05	A	Bilingual	Government
2	Lycee Bilingue de Mendong	> 05	A	Bilingue	Government
3	COSBIE	> 05	A	Bilingue	Private
4	College La Florina	< 05	B	Bilingue	Private
5	College La Lumiere	< 05	B	Bilingue	Private
6	College Laic Le Savior	< 05	B	Bilingue	Private
7	College Jesus Marie	< 05	B	Bilingue	Private
8	CPB Les AIGLONS	< 05	B	Polyvalent Bilingue	Private
9	IPONI	< 05	B	Polyvalent Bilingue	Private
10	KAD-NDAP	> 05	A	Bilingue	Private
11	Complexe Scolaire La Vision	< 05	B	Bilingue	Private
12	ITTE	< 05	B	Bilingue	Private
13	Holy Infant High School	> 05	A	Anglophone	Private
14	Franky Comprehensive High school	> 05	A	Anglophone	Private
15	Harvard school Complex	> 05	A	Anglophone	Private
16	NESCAS	> 05	A	Anglophone	Private
17	Oxford Comprehensive High school	> 05	A	Anglophone	Private
18	MEVICK	> 05	A	Anglophone	Private
19	Champions secondary and High school	< 05	B	Anglophone	Private
20	Faith comprehensive	< 05	B	Anglophone	Private
21	College MCD	< 05	B	Anglophone	Private
22	ASEC Foundation	> 05	A	Anglophone	Private
23	Mario Academic complex Mendong	> 05	A	Anglophone	Private
24	Quality International school	< 05	B	Anglophone	Private
25	Complexe Scolaire FI ANDBE	< 05	B	Anglophone	Private
26	St. Joseph Mission High School	< 05	B	Anglophone	Private
27	City Bilingual	< 05	B	Anglophone	Private

Source: Field Compilation Mfoundi Divisional Delegation (FCMDD) September 2018

The ranking of the schools is almost uniform an indication that the sample schools were properly selected for a reliable result.

3.5.2.3.Questionnaire Distribution

Another instrument and method used for data collection was the use of questionnaire. Questionnaire distribution was done in 13 schools randomly selected out of 27 schools that form the sample site Table 3.3.

- **Population of the study area**

The population of the study area is 237 geography teachers (FCMDD September 2020) both English and French schools in Yaoundé VI Municipality. This population was too large and was difficult to be used for the study given that the time of the research was limited and the research was reduced only to English speaking schools within Yaoundé VI Municipality. As such we came out with a sample population for the study which was going to represent the total population for the study area.

- **Sample size**

The total population of the study area was too large for the study. To this effect, a minimum sample size was determined using **Taro Yamane formula (1997)** with 95% confidence level. The calculation formula of Taro Yamane is presented as follows:

$$\mathbf{n = N/1+N \times (e)^2}$$

Where:

- ✓ n = The sample size required
- ✓ N = The population size **(estimated to 79 as of 2020).** In this case population of the study area is made up of geography teachers from the sample schools table 3.3.
- ✓ e = The acceptance sample error was **(%) 0.05** meaning we are very sure of the sample size
- ✓ Substituting in the formula: $\mathbf{n = 79/1+79 \times (0.05)^2}$
- ✓ $\mathbf{n = 79 / 1+79 \times 0.0025 =}$
- ✓ $\mathbf{n = 79 / 1+ 0.1975 =}$

- ✓ **n = 79 / 1.1975 = <u>65.9 or 66 Geography Teachers.</u>** became our sample size. This sample size was just enough and we decided to use 83.5% of the sample size 79 Geography Teachers.

Table 3.3: Number of Geography Teachers in each sample schools in Yaoundé VI Municipality

N^0	Names of Randomly selected schools	Number of geography teacher in each school	Ranking of schools per/number of geography
1	Lycee Bilingue Etoug-Ebe	14	1st
2	Lycee Bilingue de Mendong	12	2rd
3	Franky Comprehensive Biyem-Assi	05	4th
4	COSBIE Mendong	03	6th
5	Champions Obili (Biyem-Assi)	06	3th
6	Mario Academic Mendong	04	5th
7	NESCAS Mendong	04	5th
8	ASEC Foundation Etoug-Ebe	05	4th
9	Holy Infant High School	12	2rd
10	KAD-NDAP Simbock	03	6th
11	Oxford Comprehensive Biyem-Assi	05	4th
12	St. Joseph Mission Etoug-Ebe	03	6th
13	City Bilingual Biyem-Assi	03	6th
Total	**13**	**79**	**/**

Source: Field Compilation from school vital records 2020.

- **Rational for selecting Systematic stratified random sample technique**

It is a technique which helps in selecting a sample from a population of geography teachers ensuring that all members of the population have equal chance of being selected. Another reason that motivated the choice of this technique was to ensure a complete representativeness of the target Geography teaching population. Also, the study area was too large and a stratified random sampling was used because the researcher could not cover the whole study area given the limited time of the research.

- **Rational for selecting Proportionate stratified random sampling**

The second sampling technique that was used in this study was proportionate stratified random sampling. Since our study wanted to avoid bias, we intended the sample size should be approximately the same relative number from the two sub-groups denoted **A (Old schools >**

$5\boldsymbol{years}$**) and B (for new schools**$< 5\boldsymbol{years}$**).** We used the **proportionate random sampling formulae:**

$$\frac{\boldsymbol{population\ of\ each\ school}}{\boldsymbol{Total\ population}} \times \frac{\boldsymbol{Sample\ size}}{\mathbf{1}}$$

From the population of 79 geography teachers, the following number of questionnaire was distributed to the 13 schools with respect to their geography teaching populations'. Table 3.4 illustrates the number of questionnaire administered and retrieved in the 13 schools in %. The questionnaire was structured into open and closed questionnaire. The questionnaires were arranged in sections: Section I; captured data on demographic characteristic of the respondents, section II; on objective one of the research, section III; on objective two, section VI; on objective three and section V gathered all recommendations for chapter five of the research.

3.5.3: Validation of data Collection

In order to ensure the validity of the research tool, the essay topic was presented to some experts who gave their approval. It was believed that the topic is a current one and the geography teachers will eager to participate. The topic was then given to the teachers to respond on.

3.6: Method of Data Analysis

This section of the work focuses on analysis of data gotten from primary as well as secondary sources. The present study made use of content analysis and descriptive statistics as a method of data analysis. To be more precise, the data was analyzed using conceptual content analysis and the manifest content methodological approach, as concerns content analysis. With regard to descriptive statistics, frequency studies were made used of. The research analysis strictly followed the steps of conceptual content analysis. These steps include.

All the geography teachers were administered questionnaires on the three objectives of the study. The questionnaires are 79 in number collected at random. They were collected in order to reach three objectives; to identify the frequency awareness of geography teachers and to identify the categories which appeared most base on the perception of geography teachers in the implementation of Hack mindset method and challenges faced. Identification was done manually.

The next step is coding. The researcher coded the teachers' perceptions based on the categories. Coding was done based on the level of awareness and ignorant on usage of Hack mindset, the level of effective implementation and not effective based on the teachers' perception. Three categories of coding were used for the first objective that is the used of ignorant, aware not using and aware using. Three categories of were used for the second objective that is the used of effective, average and not effective with focus on the effective implementation. Furthermore, simple percentages and frequency tables were used in order to identify the frequency of categories of challenges teachers faced to attained the third objective.

Presentation is the step that follows. The perception based on the coding system adopted are presented in tables, in bar charts, histograms, Pie Charts and photo format. All these method presentations used express the frequency and simple percentage of each perception category as used by geography teachers. Conclusion is the last step. Based on the research questions and the analysis, conclusions are arrived at and put forth.

3.7. Method of Cartographic Products Analysis:

Cartographic products were important components of the research. This constitutes the acquisition of base maps, cartographic tools, and field cartographic data.

- **Acquisition of base maps cartographic tools**

This permitted the cartographer to have the exact coordinates of the study area so as to ensure precision in the data. There was the acquisition of base maps from the Cameroon National institute of cartographic which help in the delimitation of the study area and sitting of 13 sample schools.

- **Field cartographic data**

In the first case the researcher took a cartographer to the field. The cartographer took the coordinates of the 13 schools that were chosen for the study. This was done with the help of telephones Global Positioning System (GPS).

- **Production of maps**

The location map of the study area was generated from the coordinates with the help of maps obtained from the Cameroon National institute of cartographic alongside coordinates taken from the field. This permitted the researcher to remain within the spatial delimitation of study area and the 13 sample schools.

Table 3.4: Questionnaire administration

Schools	Number of questionnaire administered	% of administered questionnaire	Number of questionnaire retrieved	% of retrieved questionnaire
Lycee Bilingue Etoug-Ebe	14	17.7	14	17.7
Lycee Bilingue de Mendong	12	15	12	15
Franky	05	6.3	05	6.3
COSBIE	03	3.8	03	3.8
Champions	06	7.6	06	7.6
Mario Academic	04	5.0	04	5.0
NESCA	04	5.0	04	5.0
Holy-Infant	05	06	05	06
Kad-Ndap	12	15	12	15
Oxford	05	06	05	06
City Bilingual	03	3.8	03	3.8
St. Joseph Mission	03	3.8	03	3.8
ASEC Foundation	04	05	04	05
Total = 13	**79**	**100**	**79**	**100**

Source: Field Compilation from Mfoundi Divisional Delegation 2021.

3.8: CHALLENGES IN DATA COLLECTION AND ANALYSIS

It is relevant to present the setbacks encountered in realizing this study which could have had an influence on the result. A lot of challenges were faced in the course of data collection and analysis for this study.

The first difficulty faced was topic exploration and orientation of the topic since hack mindset is new CBA teaching method which is not yet included in our official geography teaching scheme and syllabuses but includes all CBA teaching methods and very new in Cameroon. In short, it was a handed over topic and required in-depth research finding from the researcher. However, the researcher overcomes this particular difficulty through the expert judgment of the supervisor and other educational educators.

The second challenge faced was the fact that access to adequate literature on hack mindset teaching method was difficult which made it very complex for the researcher to formulate his research questions, objectives, hypothesis and literature review. In fact, this work ought to have been completed much earlier if there were enough literature on hack mindset teaching method.

Thirdly, the researcher also faced a problem of primary and secondary data collection. With regards to primary data collection, most of the resource persons earmarked for the study were not willing and ready to provide the information as they were afraid the information was not for academic purposes but a source of victimization. However, the researcher made use of the research permit from the Department to prove that it was purely for academic purposes. Moreover, it was difficult booking appointments with the resource persons for the interview as most of them were hardly in their offices and even those in offices said they were busy.

Furthermore, the researcher also faced a financial challenge because the study area Yaoundé was too vast and it was difficult to cover the whole Yaoundé given the limited financial means of the researcher. This is why a sample site was identified and questionnaire or interviews were done following a sampling approach. The conclusion was for the researcher to reduce his study site to Yaoundé VI Municipality.

Another big challenge faced by researcher, was the limited cartographic knowledge of the researcher, it was difficult coming out with the accurate maps needed for the study. This problem was solved by contacting a cartographer who used his cartographic tools to come out with the required maps needed by the researcher. To add, the researcher also faced a problem of analyzing the primary and secondary data gotten from the field. This problem was solved by contacting the services of a statistician who was able to guide the researcher on how to sort manually, code and categorize his data as demanded by the researcher.

Lastly, it is difficult, if not impossible, to enter a research endeavor completely bias free (Winchester, 2000). Our knowledge and perceptions can, and often do affect our results. The researcher was bias because he focuses more on English sub system of education and this was to reduce the margin of errors and to be accurate in the study findings.

3.9: CONCLUSION

This chapter is concerned with the research methodology adopted. Thus, discussions are made on the research design, the area of the study, the population of study, the instrument and technique of data collection, the validation of data collection instrument, the method of data analysis and the difficulties encountered. The strict compliance of this chapter to the procedures of data collection makes this work scientifically correct and replicable, thereby providing an assurance that the next chapter which has to do with analysis has also been carried out scientifically. The next chapter of our work is concerned with the presentation, analysis and discussion of findings.

CHAPTER FOUR
PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.0: INTRODUCTION

This chapter is aimed at presenting, analyzing and discussing of findings, based on the research questions on the use of Hack mindset method in the teaching of CEI in geography in secondary schools in Yaoundé VI Municipality. The chapter is divided into three main sections with main focus on the three research questions;

- Geography Teachers' perception on the usage of Hack mindset method in teaching CEI in geography in secondary schools in Yaoundé VI Municipality.
- Challenges that will be faced by Geography teachers in the process of using Hack mindset method in Teaching CEI in geography.
- Pedagogic Options to be adopted and stakeholders' contributions on the use of Hack mindset method in teaching CEI in geography.

4.1: GEOGRAPHY TEACHERS PERCEPTIONS ON THE USE OF HACK MINDSET METHOD IN TEACHING CEI LESSONS.

4.1.0: Introduction

The data is collected from seventy-nine geography teachers of thirteen English sub system secondary schools in Yaounde VI Municipality. Each teacher was expected to choose from either ignorant, aware not using and aware using. Based on the research question one, the findings on geography teacher's perception on the use of Hack mindset in teaching CEI are presented in the form of table, pie chart and histogram, which indicates the frequency and in simple percentages the different ways they see the use of Hack Mindset Method in teaching CEI. The objective is to evaluate the level of awareness or ignorance of geography teachers in using Hack mindset method in teaching CEI in geography. Meanwhile, hypothesis one states that geography teachers are having a positive perception about the use of Hack mindset method in teaching CEI in geography in Yaounde VI Municipality.

4.1.1: Findings on General Perceptions on the use of Hack Mindset Method in Teaching CEI.

Mohamed. M. Muchiri. (2021) revealed that some teachers had positive attitude towards the implementation of the CBA. Based on the analysis of this research, geography teachers in the Yaounde VI Municipality have different views to a greater extent about the use of CBA methods. However, their level of perceptions has not been the same with respect to the use of Hack Mindset method in teaching CEI in geography. In order to determine their level of perceptions, respondents were asked to tick if they are ignorant, aware not using and aware using following data (Fig 4.1) obtained; 75.95% said they were ignorant, 15.19% aware not using while 6.86% said they were aware and using the Hack Mindset method.

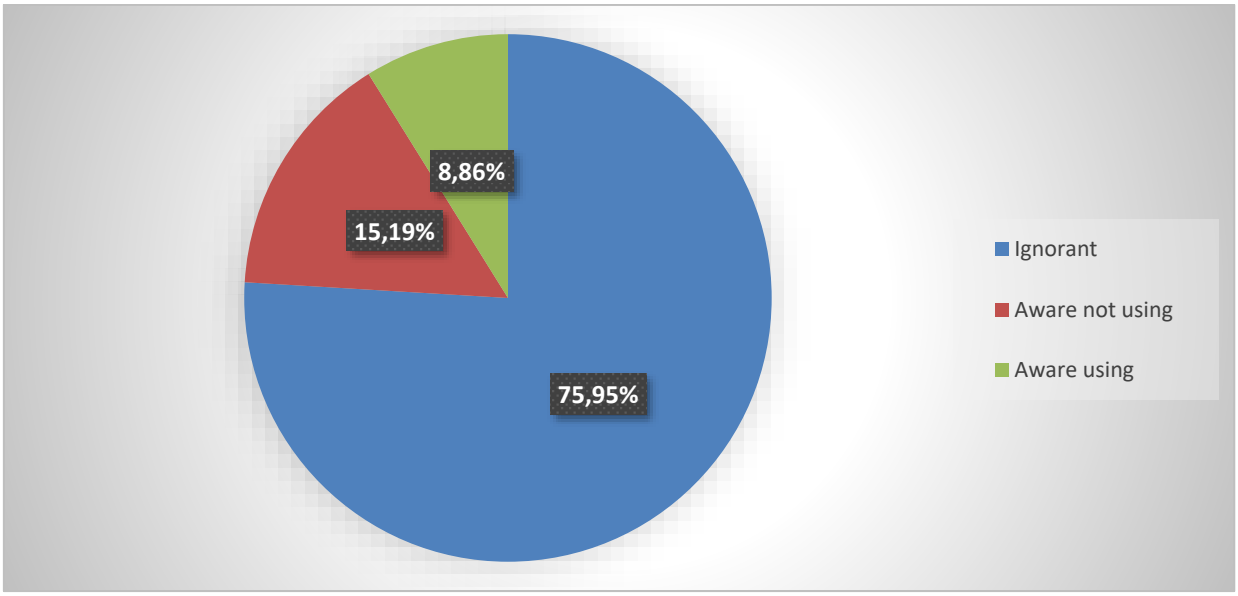

Figure 4.1: Respondents Perceptions about the awareness of Hack mindset in teaching CEI in Geography

Source: Field Survey (2022)

Figure 4.1 was analyzed base on geography teachers' characteristics such as age group, longevity in service, level of training and school status. In terms of the characteristics, 75.95% were ignorant of this method in teaching CEI. This is because 60 respondents out of 79 see this method to be new to them because it is not included in their current scheme of work and have been working between 0-5 years and majority trained were still coming out from ENS Yaounde, Bambili and Maroua. The low level of awareness with an ignorant rate of 75.95% is because majority of the respondents from this fraction of the sample population falls within the age group 40-60years and above and has worked for more than 10years under the OBA. They are

more familiar with OBA and another fraction were not trained geography teachers with 01 from Government schools and 14 from private schools.

However, low awareness was witnessed in both government and private schools with 19 respondents out of 79 said they are aware due to their participation in CBA pedagogic seminar which has triggered research for new CBA teaching methods like Hack mindset. Although the rate of awareness was small, it is more visible with about 15.19% aware not using and with only 6.86% aware and using (Fig 4.1). Based on the above findings, it could be ascertained that the use of CBA in the teaching of Geography is received with mixed feelings and viewed from three perspectives; while the majority are ignorant of the method, a minority still remains aware and trying to adapt to this method, which corroborates the views of Aidyn Intykbekov (2017) that teachers understand CBA PBL from both positive and negative perspectives through its perceived benefits and implementation.

4.1.2: Findings on the Perception on the use of Hack Mindset Approaches in teaching CEI in Geography.

Based on the analysis of this research, geography teachers in the Yaounde VI Municipality have different views to a greater extent about the use of Hack mindset approaches in teaching CEI in Geography. However, their level of perceptions has not been the same with respect to the use of these approaches in teaching CEI in geography, given the fact that 57 respondents out of 79 (Table 4.1) were completely ignorant of Hack mindset approaches. In order to ascertain their level of perceptions analysis was based on the three main Hack mindset approaches namely; Bias to action, fail forward, and start small (Josh Linkner, 2017**)**.

According to Mohamed. M. M, majority of the teachers are not conversant with the concept of the CBA, revealing that despite the training, a good number of them were struggling with the concept of the CBA and lacked the capacity demanded by the CBA framework (2021). In line with this, this research shows that only 22 respondents out of 79 with about 27.85% were aware of Hack mindset method approaches. Findings reveals that from 22 respondents, 12 respondents were aware but not using about 15.20% while the remaining 10 respondents with about 12.65% were aware and using indicating Table 4.1 a very low usage due to the fact that 75.95% Fig 4.1 were completely ignorant of the Hack mindset method talk less of its three approaches.

Table 4.1: Respondents Perceptions about Hack mindset method Approaches in teaching CEI

Categories	Frequency	Percentage (%)
Ignorant	60	75.95
Aware not using	12	15.19
Aware using	07	8.86
Total	**79**	**100**

Source: Field Survey (2022)

4.1.2.1: Findings on Bias to Action Approach.

The data is collected from seventy-nine (79) geography teachers from 13 secondary schools in Yaounde VI Municipality on their perception on the use of Bias to Action. Based on the research questions, the findings are presented in a pie charts which indicates the frequency usage of each approach. In order to determine their level of perceptions, respondents were asked to tick if they are ignorant, aware not using and aware using following data (Fig 4.2) obtained revealed that 50 out of 79 respondents with about 63.29% said they were ignorant of Bias to action approach, 12 out of 79 respondents with about 15.20% said they were aware and not using while 17 respondents with about 21.51% said they aware using.

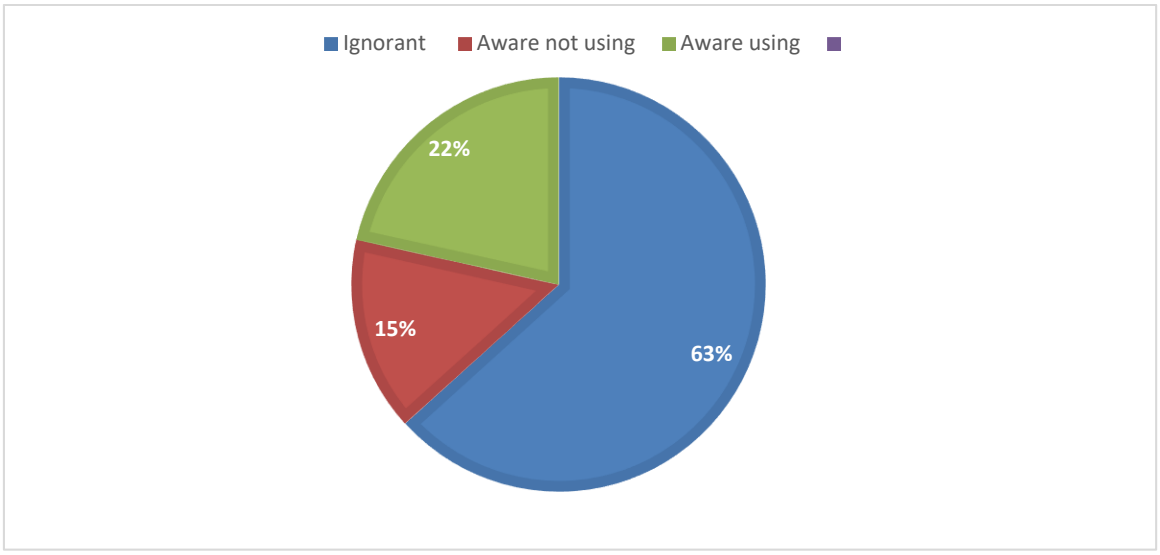

Figure 4.2: Respondents Perceptions about the awareness of Bias to Action Approach of Hack mindset in teaching CEI in Geography

Source: Field Survey (2022

Fig 4.2 indicates a low percentage of about 36.71% were aware of the bias to action approach. This fraction were mostly teachers coming out from training schools and are opened to new

teaching approaches based CBA and deeper learning. However, 12 respondents of about 15.20% from this fraction were aware not using and 17 respondents of about 21.51% were aware using indicating a very low usage of the approach. Even though they have attended recent pedagogic seminars organized on CBA teaching method approach they rather pay limited time to research on recent CBA teaching approaches like Bias to action which deals with discovery techniques in teaching like giving assignment, interview, field work, brainstorming all on the side of the students. Meanwhile, on the other hand, a high percentage of the teachers were ignorant about 50 out of 79 respondents (63.29%). This was due to neglect on the part of the teachers who were trained under OBA and have refused to adapt to new CBA teaching approaches despite longevity in services. Nevertheless, factors like; limited seminars, workshops for continuous teachers' development, lack of digital devices, skilled computer instructors and parental engagement in teaching and learning processes were cited as factors that were likely to hinder effective implementation of the CBA (Mohamed. M. Muchiri, 2021).

4.1.2.2: Findings on Fail Forward Approach.

The data is collected from 79 geography teachers from 13 schools on the use of Fail forward approach in teaching CEI in Yaounde VI Municipality. Based on the research questions, the findings are presented in a table which indicates the frequency usage of this approach. In order to determine their level of perceptions, respondents were asked to tick if they are ignorant, aware not using and aware using and the following data Table 4.2 reveals that 58 out of 79 respondents, that is 73.41% said they were ignorant of the Fail Forward approach while 26.59% about 23 respondents out 79 said they were aware with a low usage rate of about 10.14% with 10 respondents out of 79.

Table 4.2: Respondents Perceptions about the Awareness of Fail Forward Approach of Hack mindset method in teaching CEI in Geography

Teachers' Perceptions	Frequency of those aware of Hack mindset method	Percentage (%)
Ignorant	58	73.41
Aware not using	13	16.45
Aware using	10	10.14
Total	**79**	**100**

Source: Field Survey (2022)

From the above result, the researcher found out that a low percentage 26.59% Table 4.2 were aware with only 10.14% aware using fail forward approach. This fraction was made up of geography teachers that are just coming out from training schools and opened to new approaches and techniques in teaching, exposed to official textbooks and pedagogic seminars which drills them on fail forward techniques in teaching like small focus group discussions, document analysis and integrated activities which respect the use of guideline questions aimed at enforcing knowledge construction on the part of students. Meanwhile, a high percentage 73.41% Table 4.2 were ignorant of the fail forward approach indicating geography teachers that were completely blank about this particular approach. The main reason for this was due to neglect on the part of the teachers who were trained under OBA and are not opened to CBA. However, these are teachers that do not make good use of recent official schemes of work, syllabuses, textbooks and knowledge gained from pedagogic seminars on techniques used under fail forward approaches.

Therefore, this finding did not correspond with what was highlighted by some scholars such as Dhakall. K. R. (2019) who posits that interactive, collaborative and teacher centered strategies and methods are applied in the geography class room. There are some strengths and weaknesses of geography curriculum and geography textbook. The finding of the research indicates that there are so many problems in teaching CEI geography in secondary schools using fail forward approach such as limited used of instructional materials, reference books, curriculum, textbooks etc. However, it was noted that, teachers have positive perception and experience towards geography teaching in spite of various problems.

4.1.2.3: Findings on Start small Approach.

Lastly, analysis of geography teacher's perception on use of start small approach reveal that there is a slight variation based on the view of the 79 sample teachers drawn from 13 schools in Yaounde VI Municipality. The level of use of start small approach has not been the same in teaching CEI. Based on the research questions, the findings are presented in a pie chart which indicates the frequency usage of this approach. In order to determine their level of perceptions, respondents were asked to tick if they are ignorant, aware not using and aware using and the following results Fig 4.3 were obtained, 40 respondents out 79 about 50.63% said they were ignorant, 13 respondents out 79 about 13.92% were aware not using while 28 respondents 79 about 35.45% agreeing they aware using.

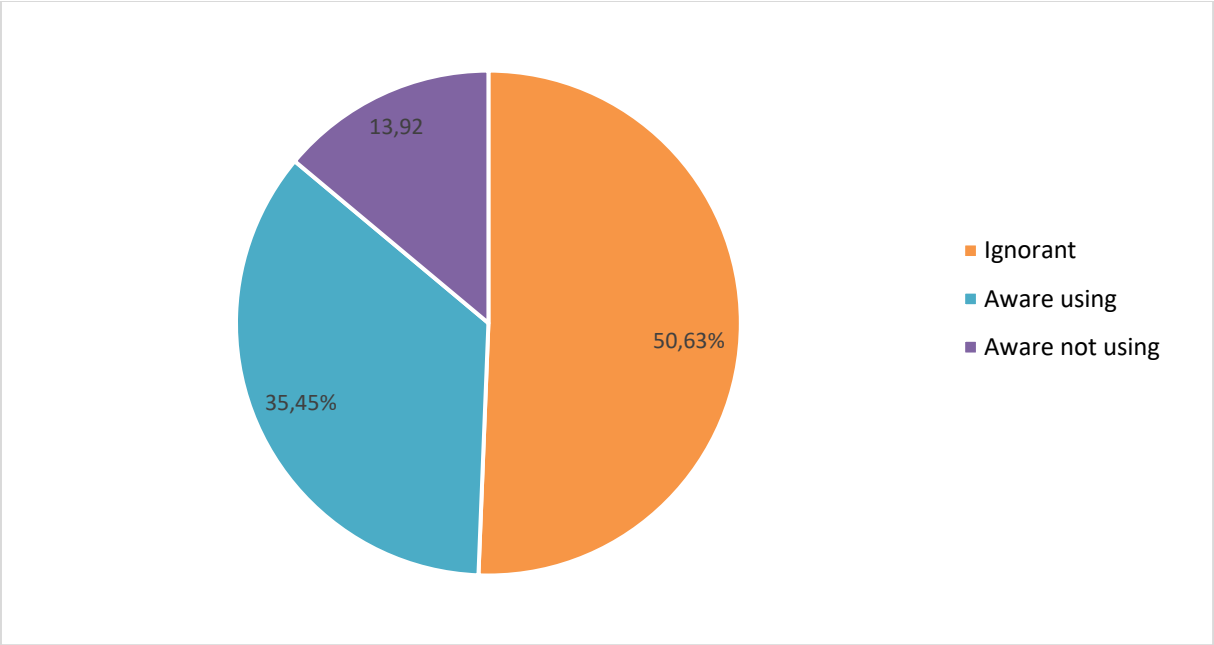

Figure 4.3: Respondents Perceptions about the Awareness of Start small Approach of Hack mindset method in teaching CEI in Geography

Source: Field Survey (2022)

Most of the teachers interviewed pointed out that it is an important issue and that humans should take care of the environment. As expressed by Jatzko. K. (2016), the majority of teachers seem to be aware about local environmental problems and this knowledge is further passed onto the students via creative environmental activities. From Fig 4.3, despite the high rate of ignorance of about 50.63% on the use of start small approach there is a slight increase in the number of teachers who are aware of the approach of about 49.37%. The main reason is because majority of the teachers who were aware about 35.45% were aware using because they have been introduced into problem solving teaching techniques under OBA and CBA. For example, teaching by doing with lot of examples like outdoor studies through field work, interviews, investigation and project writing using PBL. This result was confirmed due to the fact that majority of the teachers teaching CEI in secondary schools in Yaounde VI Municipality accepted that they usually engage their students into creative environmental activities like school clean up campaigns, open their doors to NGOs that talk on environmental sustainability, organized sensitization talks and encourage project writing on pressing environmental issues with sponsorship from NGOs and the Yaounde VI local council. However, the high level of ignorance on the use of start small approach was also due to neglect on the part of the teachers.

4.1.3: Findings on the General Perception of adopting and using of Hack Mindset Method teaching CEI in Geography.

From results presented, analysis and discussion of this research, geography teachers in Yaounde VI Municipality have different views on the usage of Hack Mindset method and its three approaches. Findings reveal that from the sample teacher size of 79 teachers, their level of perception has not been the same with respect to the use of Hack mindset method and approaches in teaching CEI in Geography in secondary schools in Yaounde VI Municipality. However, their perceptions towards Hack Mindset approaches have not been the same in teaching CEI in geography. The main aim was to provide answer to the research question one based on the research hypothesis one which state that ‘‘Geography teachers have a positive perception about the use of Hack Mindset method and its approaches in teaching CEI in geography’’. The main result finding in this section revealed that out of the 79 respondents a high percentage of about 75.95% were ignorant of the Hack mindset method and its three approaches. Meanwhile, the researcher gathered that, a low rate of about 24.05% were aware with little usage of the method and it approaches. This therefore, rejects the hypothesis one which states that, geography teachers were positive in their perception about the use of Hack mindset method in teaching CEI in geography.

In order to ascertain the future implementation or usage of Hack mindset method in teaching CEI in geography, respondents were asked to tick either; had positive opinions, negative opinions or mixed feeling as a pedagogic option of adopting the Hack mindset method and its approaches. Their ticks gave us the following results Table 4.3 were 82.27% said it was positive pedagogic option, 12.65% said it was negative pedagogic option while 5.08% had a mixed feeling.

Table 4.3: Respondents Perceptions on Future Effective Implementation of Hack mindset method in Teaching CEI in Geography

Categories	frequency	Percentage (%)
Positive pedagogic option	65	82.27
Negative pedagogic option	10	12.65
Mixed feeling	04	5.08
Total	**79**	**100**

Source: Field Survey 2021

From the Table 4.3, it was reveal that 65 respondents out of 79 with about 82.27% had a positive opinion and that the usage of Hack mindset method would be effective due to the fact that the education stakeholders and structures in place since 2012 until date has put in place strategies for the effective implementation of any CBA teaching method like Hack mindset. Also, to an extent, the availability of didactic materials such as schemes of work and syllabuses, organization pedagogic seminars in Mfoundi Division. That set, follow-up from Regional and Divisional Pedagogic Inspectors in geography are some of the supportive ideas behind the positive perception about the use of Hack mindset method in teaching CEI in Yaounde VI Municipality secondary schools. However, findings reveal that there is a low rate of negative and mixed feeling about 17.73% with 10 respondents out of 79 about 12.65 having a negative view while 04 respondents out of 79 had mixed feeling of about 5.08% about effective use of Hack mindset method. This finding is akin to the views of Glenna. A. E. H and Sølvik. R. M. (2021) who uphold that majority of teachers facilitate a supportive learning environment by actively involving students in the classroom interactions and dialogue needed to promote deeper content understanding and metacognitive reflection.

They further argue that in applying deeper learning within class setting, teachers facilitate reciprocal and support purposeful classroom interactions by employing varied teaching practices that would further address students' need for deeper learning. This view is equally supported by Bipoupout. J. C. (2007) who suggests that the principles of the competency-based approach have a significant positive contribution towards a more effective and equitable school environment. Thus, the effective implementation of Hack mindset method and approaches will only be negative if there are no in-services pedagogic training, pedagogic seminar and workshops organized by stakeholders to educate teachers on the use of Hack mindset as a CBA teaching method.

4.2: CHALLENGES FACED IN USING HACK MINDSET METHOD IN TEACHING CEI IN GEOGRAPHY.

4.2.0: Introduction

The data is collected from seventy-nine geography teachers of thirteen English sub system schools in Yaounde VI Municipality. Each teacher was expected to choose from either inadequate knowledge on Hack mindset, poor mastery of CBA teaching techniques as methods, inadequate didactic materials and other challenges. Based on the research question two, the findings on possible challenges faced by geography teachers on the use of Hack mindset in

teaching CEI are presented in the form of a table, histogram, bar chart and photos, which indicates the frequency and in simple percentages on the different ways they see the challenges face in course of using Hack Mindset Method in teaching CEI. The objective is to identify the main challenges geography teachers are to face in using Hack mindset method in teaching CEI in geography and to suggest best pedagogic options and evaluate stakeholders' contribution for an effective implementation. Meanwhile, hypothesis two states that the major challenges geography teachers are to face using Hack mindset method in teaching CEI in geography in Yaounde VI Municipality are related to inadequate didactic resources and technical knowledge.

4.2.1: Findings on the major Challenges faced by Geography Teachers' in Teaching CEI in Geography.

Based on the analysis of this research, geography teachers in the Yaounde VI Municipality have different views about the main challenges in the course of using CBA methods. However, their level and possible challenges has not been the same with respect to the use of Hack Mindset method in teaching CEI in geography. In order to determine their level of perceptions, respondents were asked to tick out of four categories of difficulties either inadequate knowledge on Hack mindset, poor mastery of CBA teaching techniques as methods, inadequate didactic materials and other challenges. The following data Table 4.4 obtained; 30.37% said inadequate knowledge on Hack mindset, 26.58% said poor mastery of CBA teaching techniques as methods, 25.31% said inadequate didactic materials while 17.74% said there are other challenges when using the Hack Mindset method and it approaches.

Table 4.4. Respondents Common Challenges to be faced in using Hack mindset method in Teaching CEI in Geography

Categories	Frequency	Percentages (%)
Inadequate Knowledge on Hack mindset	24	30.37
Poor Mastery of CBA Teaching techniques	21	26.58
Inadequate didactic materials	20	25.31
Other Challenges	14	17.74
Total	**79**	**100**

Source : Field Survey 2022

From the 79 respondents some common challenges were grouped under four categories; inadequate didactic materials, poor mastery of CBA teaching techniques, inadequate knowledge about Hack mindset method and other challenges (Table 4.4). The findings were

regrouped under four categories of difficulties where 24 respondents out 79 said its inadequate knowledge about Hack mindset method because it a new CBA method not found in our pedagogic documents, 21 respondents said its poor mastery of CBA teaching techniques because many teachers do not understand better the concepts of CBA talk less of a new concept like Hack mindset method which is new, 20 respondents said inadequate didactic resources is another major problem because most schools especially private lack the necessary didactic materials to enhance CBA teaching transaction while the remaining 14 respondents said there are others challenges that will hinder the teaching of CEI using Hack mindset in Geography. This finding akin with that of Wiysahnyuy. L. F. (2021) who was able to indicate the possible problems teachers in secondary schools in Bamenda suffers from the in the full implementation CBA.

The subsequent paragraphs demonstrate how these challenges could affect the full usage of Hack mindset method in teaching CEI in Geography. However, respondents were able to highlight in the third research question some major pedagogic strategies and frame work to be put in place in Yaounde VI Municipality to enhance teaching CEI in Geography despite the challenging pedagogic abnormalities.

4.2.1.1: knowledge on Hack mindset

Findings from 24 respondents out of 79 revealed that inadequate knowledge on Hack mindset as a deeper learning-teaching method is the first major challenge (Table 4.4). About 30.37% of respondents confirm it is a problem that could affect the use of Hack mindset in teaching CEI in Geography. This is due to the fact that the method is new and borrowed from American experiences without any official pedagogic document in Cameroon and Yaounde VI Municipality with enough written information about the method. Secondly, our findings indicate that teachers do not make out time to discuss on new areas in the teaching field especially in the area of new teaching methods. Some suffer from financial problems and are hardly supported by the administration to help them upgrade their knowledge and skills in deeper learning as well as student-centered teaching methods like the Hack mindset in the teaching of CEI in Geography. This correlates with the study of Baidoo-Anu, David *et al.*, (2019) who found out that lack of time to plan and inadequate financial support from the school administration are the main factors that affects the organization of fieldwork as teaching method. Thus, there is the need for financial resources for teachers to ensure better planning and the usage of Hack mindset method with adequate knowledge on the part of teachers.

4.2.1.2: Mastery of CBA or Hack Mindset Method:

Findings from 21 respondents out 79 revealed that, mastery of CBA teaching methods, integrated approaches and techniques is the second challenge (Table 4.4). About 26.58% confirmed this as a serious pedagogic obstacle in the use of Hack mindset method in teaching CEI in geography despite the contributions from stakeholders. This is due to the fact that CBA pedagogic teaching methods in the Harmonized Geography scheme of work (MINESEC 2014 and 2019) for the first and second cycles syllabuses are complex teaching methods which are not clearly defined as CBA teaching methods. Most of the HODs in Government and private schools state that *"these methods we use today for clear explanations are more of a CBA teaching-learning techniques and not CBA teaching-learning methods"*. To them, geography teachers in teaching CEI used these approaches as methods due to insufficient training acquired and poor mastery of CBA teaching concepts and to integrate a series of approaches and techniques in teaching CEI in geography. Majority of respondents think, *'brainstorming which is more of a Hack mindset method teaching technique under Bias to action approach, is rather considered as a CBA teaching method as prescribed by the Cameroon geography official scheme and syllabus are more complex in nature and has confused teachers making it difficult for the use of Hack mindset in teaching CEI in geography due to incomplete training and the fact that some of the teachers were not well trained''.* Furthermore, a geography teacher from private school, confirmed *''some teachers lack the will power to research on new CBA teaching methods and other rather prefer OBA teaching method base lecture techniques which saves time''.* This finding akin with Abdulkadir M Yahaya1 *et al.*, (2021). Their results revealed that the demonstration method of teaching was the most used by teachers ahead of others while the students who responded say they did not know the teachers' actual method in teaching them and findings affirmed that there was poor professional proficiency on the part of most teachers.

4.2.1.3: Didactic Resources:

According to Mugisha. J. K. (2020) indicated that the availability and frequently used instructional resources in geography such as text books, pictures and real objects help to demonstrate, emphasized a point and observed a phenomenon. Mugisha thinks the frequent used of geography instructional resources have a positive significance on students' learning outcomes such as attracting students' attention, arousing students learning, gaining practical skills, and improving students' performance. However, another main finding of this study indicates 25.31% (Table 4.4) of the respondents asserted that the insufficient didactic resources

or teaching-learning facilities is a major difficulty to be faced by teachers in teaching CEI using Hack mindset method. The inadequate supply of official geography textbooks, lack modern libraries for update research, lack of concrete teaching aids, Wi-Fi and Google search engine are all potential difficulties that will hinder the effective use of Hack mindset in teaching CEI in geography.

This finding complements that of Dhakall, K. (2020), whose results reveal that inadequate didactic resources are not potential difficulties, but rather the inabilities of teachers to use instructional materials due to their own laziness, lack of skills and strategies, financial constraints, lack of appropriate content in textbooks, time constraints, lack of support from authorities, and a lack of geography resource rooms. In Ng'eno, J. K.'s (2015) study, it was revealed that instructional resources such as textbooks were used, but were found to be inadequate. The study also found that textbooks, globes, and maps were frequently used while dioramas, the internet, and radio were rarely used. The study showed that most of the teachers never used computer at all since most of them are not computer literate and for those who used, minimal time is allocated to them. The study also revealed that most of the teachers never used field trip as it requires a lot of time and finance to which most of the school do not give priority.

4.2.1.4: Other challenges:

Of all the highlighted challenges, it was obtained that 17.74% that is 14 respondents out of 79 considered some of the weakness as other challenges. Geography teachers face numerous challenges when implementing Competence-Based Curriculum (CBC). These challenges include overcrowded classrooms, limited teaching hours, lack of technical know-how, difficulties in producing teaching and learning aids, struggles relating some lessons to real-life situations, financial backgrounds of students, and negative attitudes towards assignments. All of these factors make it difficult for Geography teachers to know what is expected of them during the teaching and learning transaction of CEI in geography (Table 4.4). However, there was a great variation at the level of other challenges face by geography teachers teaching CEI with respect to the use of Hack Mindset method in Yaounde VI Municipality. In order to be sure of these other major pedagogic challenges, 79 respondents were asked to tick out of many other challenges with results presented on a pie chart and the following data (Figure 4.4) were obtained: Out of the 79 respondents who agreed that the above highlighted challenges are responsible for the low usage of Hack mindset method in teaching CEI in geography. An estimated 30% agreed its overcrowded classrooms and limited teaching hours is a problem.

Again another 16.4% share the view that lack of technical know-how and teaching-learning aids is what possess a worry. Similarly, about 20.25% respondents' noted that some of the difficulties are related to some real life situations and 25.31% as a result of financial background and negative attitudes towards assignments.

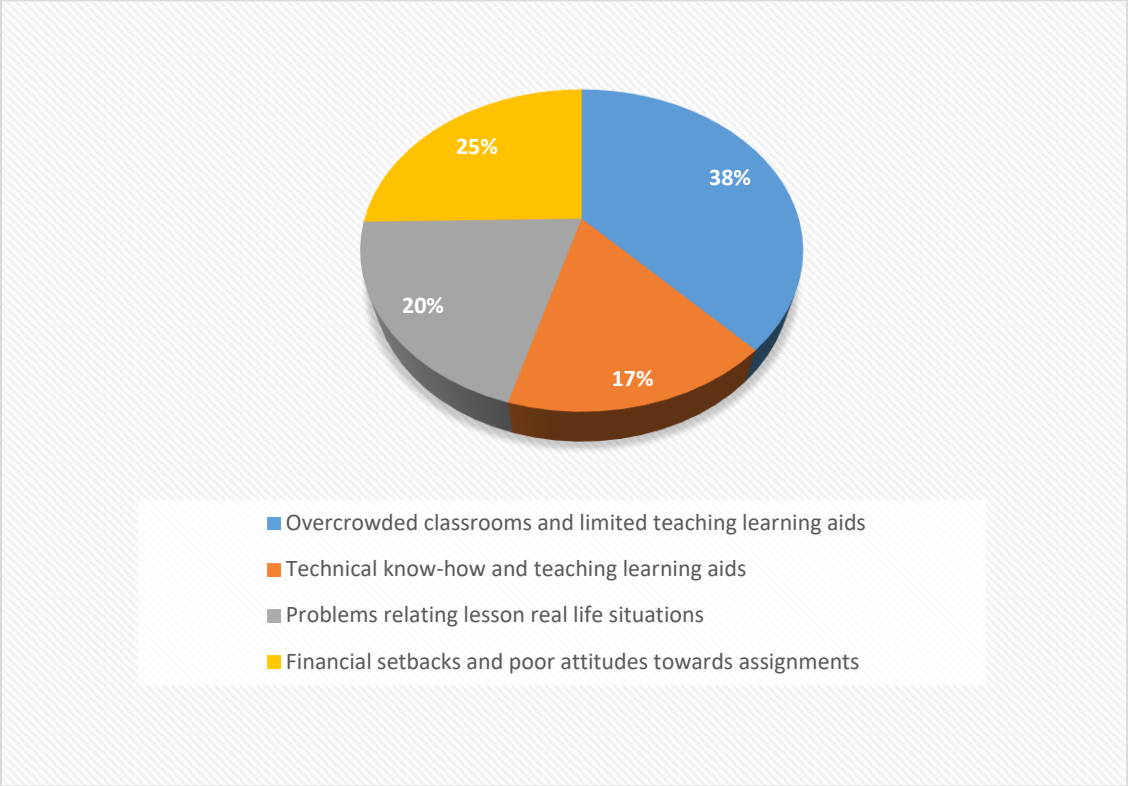

Figure 4.4. Geography Teachers' Perceptions on other challenges faced in using Hack mindset method in Teaching CEI in Geography

Source : Field Survey 2021

- **Overcrowded classrooms and Limited teaching hours:**

Findings revealed that 30 respondents out 79 confirmed that It sounds like classroom overcrowding may be impacting the effectiveness of using Hack mindset methods for teaching CEI in geography. It was agreed that 37.97% of respondents asserted that the over-crowded nature of the classrooms made it difficult for geography teachers to effectively use this Hack mindset method and its approaches. They indicated that the student-teacher ratio in most government schools was too high and made it difficult for teachers to consider individual needs in the course of teaching Photo 4.1. One of the respondent teaching Geography clearly stated that *"I will find it very difficult to fully use Hack mindset in teaching CEI in geography because I teach at least one hundred and sixteen students in a form five class. At times I prefer using the*

lecture method so as to complete my scheme of work before the end of the academic year." This is an indication that some teachers are concerned more with how fast they can cover the schemes of work assigned to them before GEC end of term evaluation than the learning outcomes of the students.

A majority of the 30 respondents also emphasized that effective used of Hack mindset method and its approaches is time consuming and the number of teaching hours allocated for Geography lessons per week in some private school is not sufficient. All the 13 schools operate their pedagogic interaction under two periods of 50 minutes each which was not enough for the use of hack mindset in the teaching of CEI in geography Table 4.5.

In some privates' schools, some Geography teachers assert that the number of geography students outnumbered the classrooms and the geography teaching staff (Table 4.5) due to the internal displacement of persons (IDPs) from crisis hit regions leading to overcrowded cleanroom making interaction difficult with a high ratio of 1: 167students within the study site. This finding collaborate with other studies (Kyobe & Rugamoyo, 2005; EU, 2015; Mosha, 2012; Makunja, 2016 and Kyafulilo, et al., 2012) which said some teachers complain that most of the institutions do not create conducive and friendly teaching and learning environment for effective use of CBA.

Table 4.5: Total Number of Geography Teachers, Geography students, classrooms in each sample school in Yaoundé VI Municipality

N⁰	Sample Schools	Total № of Geography Teachers in each School	Total № of Geography students in each school	Total № of Classrooms in each school	50 munites per Period (02 Periods in each school)
1	Lycee Bilingue Etoug-Ebe	14	3000	30	02periods
2	Lycee Bilingue de Mendong	12	1500	25	//
3	Franky Comprehensive Biyem-Assi	05	970	22	//
4	COSBIE Mendong	03	1000	10	//
5	Champions Obili (Biyem-Assi)	06	850	17	//
6	Mario Academic Mendong	04	654	42	//
7	NESCAS Mendong	04	1000	10	//
8	ASEC Fondation Etoug-Ebe	05	1000	15	//
9	Holy Infant High School Melen	12	989	21	//
10	KAD-NDAP Simbock	03	540	10	//
11	Oxford Biyem-Assi	05	1000	14	//
12	St. Joseph Mission Etoug-Ebe	03	700	10	//
13	City Bilingual Biyem-Assi	03	900	15	//
Total	**13**	**79**	**13,403**	**241**	**//**

Source: Field Compilation from school vital records 2020.

The study further reveals that, limited infrastructures in term of classroom (table 4.5) is one of the challenge that geography teachers will faced in teaching CEI in geography using Hack mindset method despite the contributions from stakeholders. It was reported and discovered that infrastructures difficulties were more common with private schools because the lack the financial sustainability and tends to rely on school fees, donations and contributions as their major source of finance. This would be a major obstacle to the smooth use of hack mindset method because of overcrowded classrooms in government and private schools. One of respondents assert that *''most proprietors in private schools purposely over crowd their classes*

because they want to reduce more teaching hours and maximize profit''. Thus, this financial consciousness of cost and the absence of enough infrastructures have jeopardized the use of hack mindset in teaching CEI in geography in overcrowded classrooms. It was again confirmed by Nkemleke. E. E. and Fube. E. M. (2021) that most Form 5 classrooms in secondary schools in Cameroon are overcrowded due to high in-take of students characterized with inadequate didactic materials, inappropriate and small classroom sizes impede the proper teaching and learning of cartography using the CBA. Therefore, there is need for classroom smart strategies, workshops and seminars aimed at enhancing teachers' proficiency in teaching cartography using the CBA.

- **Technical know-how and teaching-learning aids:**

Another finding indicates that 13 respondents out of 79 with about 16.47% revealed that limited technical know-how and difficulties in producing and using teaching-learning aids is another obstacle after overcrowded classrooms. To this fraction of respondents, this problem will greatly affect the used of Hack mindset method in teaching CEI in Geography. Results obtained from different school administrators and Geography teachers revealed that 4 out of 13 sample schools did not have projectors and the rest having which ranging between 1 to 2 projectors, 7 out of 13 did not have Wi-Fi and double search engine meanwhile 12 schools had computers, ranging from 2 to 40 which could aid the teaching of CEI in geography (Table 4.6). However, majority of them were not functioning, majority of the teachers lack the educational technological knowhow to use some of these technological devices like projectors and worst of all, in most of the schools, the available existing computers which could aid students compile and construct knowledge using Bias to action approach were reserved for ICT and not for teaching of CEI in geography.

A detail analysis on teacher's technical know-how on the use of Hack mindset base on train and research on new CBA reveals that majority of the teachers were trained but lack the spirit and skills to research on new CBA teaching method like Hack mindset. The lack of technical knowledge on computer skills will hindered the full use Hack mindset method and thus orient their teaching towards face-to-face tutorials (Table 4.6). This is in line with findings of Tanyanyiwa. I. V. and Madobi. R. (2021) Geography and Environmental Studies Department (DGES) in Zimbabwe states that students' lack of computer skills hinders the full use of E. Learning, as students continue to rely on the printed module and face-to-face tutorials and

recommends that the DGES offer an introductory course in computer use for first-year students and continuous ICT skills workshops to equip them with ICT skills.

Also, findings show that teacher's lack the technical know-how producing CEI teaching aids use in teaching CEI in geography using Hack mindset. This is due to inadequate training and researches on new CBA geography teaching methods and respective teaching aids. Majority of the teachers were trained but lack the spirit and skills to research on new CBA teaching method like Hack mindset which indicate why majority were ignorant of the method meanwhile small proportion that was aware from the sample schools had limited technical knowledge of using Hack mindset method (Table 4.6). It further supported by Sofowora O. A. and Egbedokun A. (2010). However, their findings show that Geography teachers had access to computer but did not have the pre-requisite ICT skills and that out of the modern technologies available for teaching Geography, the most commonly used are: instructional television, instruction radio and video. Other findings showed that Geography teachers do not know the instructional interactive web packages available free for teaching Geography. Not only this, but teachers rarely make use of multi-media presentation in teaching Geography where as many of these facilities are available free on the web for teachers use. Thus, limited skills and cost of utilization were ranked highest as one of the factors preventing teachers from using the new technologies in teaching Geography.

Table 4.6: Number of Pedagogic devices available for Geography Teachers in using Hack Mindset method in teaching CEI in Geography

Sample school Administrators	Technological Devices			Usage	
	№ of Projectors	№ of Computers	Wi-Fi and Google engines	ICT	CEI
City Bilingual	-	20	Yes	Yes	No
ASEC Foundation	01	20	No	Yes	No
St. Joseph Mission	-	-	No	-	No
Oxford	01	40	No	Yes	No
Kad-Ndap	01	02	No	Yes	No
Holy-Infant	02	35	Yes	Yes	No
NESCA	-	20	No	Yes	No
Mario Academic	01	42	Yes	Yes	No
Champions	02	21	No	Yes	No
COSBIE	-	20	No	Yes	No
Franky	01	38	Yes	Yes	No
Lycee Bilingue Etoug-Ebe	02	40	Yes	Yes	No
Lycee Bilingue de Mendong	02	40	Yes	Yes	No
Total = 13	**13**	**4,298**	**Yes = 06 / No = 07**	**12**	**00**

Source: Author's Field Survey (2022)

- **The difficulties of relating some lessons to real life situations:**

Findings from the field revealed that 16 respondents out 79 of about 20.25% confirmed that Geography teachers fine it very difficult to relate real life situations in contextualizing, introducing and justifying their CEI lessons. Thus, this has made it difficulties for Geography teachers to use the Hack mindset method in the teaching of CEI in Geography. Despite the fact that majority of the Geography teachers in the area under studies attend CBA pedagogic seminars and workshops, they are reluctant to apply them in their lesson introduction (lesson contextualization, justification and stating clearly the real environmental situation linked to their lesson). Due to their neglect and preference to the old traditional teaching methods and technique called lecture method and the fact that it was recently integrated in the first and

second cycles syllabus as a module. Metadata. N. N. N. (2014) in her findings on the 'Teaching Environmental Education in Secondary Schools in Kenya'' established that though Environmental Education (EE) is adequately incorporated in the secondary school syllabus of subjects studied; various challenges are faced by the teachers in the teaching of EE elements in these subjects because some of the EE themes are fragmented, inadequate instructional materials, inadequate training of teachers to handle EE related topics in their subject areas and over-reliance on the lecture method of teaching among others. However, it was discovered that based on attitudes towards EE both teachers and students were found to be highly positive in embracing EE. From the research findings, major recommendations such as adequate provision of instructional materials, a review of pre- and in-service EE programmes for teachers as well as regular monitoring of EE programmes among others were made. Another study corroborates that students' conceptual and stereotypical errors, in the different educational stages, vary according to the type environmental lesson for example climate, weather, climate change, landscape and level of education for example Primary, Secondary, University). They are persistent and continuous, given that they are repeated and appear anchored in the ideas and knowledge development of students regarding the problems and the study of the climate throughout their education Project House Molyko-Buea Benito Campo-Pais et al (2020).

- **Financial background and negative attitudes towards assignments:**

The study also revealed that another serious weakness for the use of Hack mindset method in teaching CEI in Geography some of respondents complained on students' financial constraints and negative attitudes towards assignments. About 23.3% confirmed this finding and raising the awareness that some of the Geography students come from poor family background, making it difficult for teachers to integrate students into discovery search under Bias to action. Thus, teachers are forced to depend on printed module documents to enhance teaching in CEI lessons in Geography. Worst of all findings also shows that majority of the Geography students have negative attitudes towards assignments under Bias to actions due to neglect from parents (PTA) who do not create time at home to ensure that students do their assignments and limited follow-up from some Geography teachers who gives assignment but do not correct them for effective constructions of knowledge. This finding is in line with that of Sozen. E. (2019) which indicated that 2018 revised curriculum implemented towards active, constructivist teaching learning approach and student centered program, teachers still utilize the traditional instructional methods according to students. Teachers mainly use textbooks and they hardly use instructional materials and teachers only use traditional assessment methods. The use of student portfolios,

group work and student projects hardly exist in classrooms. Gyamfi. E (2020) therefore, recommended that teachers in the various schools should motivate their students to take Geography lessons seriously and study it well, as it could be of relevance to them in the near future while Government and other stakeholders should provide schools with modern teaching and learning resources so as to help teachers to explain very well Geography concepts to the understanding of their students. Despite these setback, Onuoha. J. C. (2014) findings revealed that, students generally have a positive attitude towards the learning of Geography while a lesser number (strongly) agreed that Geography textbooks are expensive, difficult to understand and that Geography teachers do not teach well.

4.3: PEDAGOGIC SOLUTIONS OR OPTIONS TO BE ADOPTED ON THE USE OF HACK MINDSET METHOD IN TEACHING CEI IN GEOGRAPHY.

4.3.0: Introduction

The data is collected from seventy-nine geography teachers of thirteen English sub-system schools in Yaounde VI Municipality. This section is determining the best pedagogic sustainable options which could be adopted for a sustainable implementation of Hack mindset method in teaching CEI in geography in Yaounde VI Municipality. From five proposed pedagogic options, each teacher was expected to choose from either enforcing stakeholders contributions, participatory pedagogic development approach (PPDA), ensuring a sustainable educational system, encourage the organization pedagogic seminars and CBA methodological modeling for a sustainable CBA teaching methods. Based on the research question three, the findings on possible pedagogic solutions to be adopted by Geography teachers on the use of Hack mindset in teaching CEI are presented in the form of a bar chart and photos, which indicates the frequency and in simple percentages on the different ways they see the pedagogic strategy in course of using Hack Mindset Method in teaching CEI. The objective is to identify the main solutions to be suggested as best pedagogic options for an effective implementation of Hack mindset method in Yaounde VI Municipality. Meanwhile the hypothesis three states that organization pedagogic seminar is the major pedagogic option to adopted for effective use of Hack mindset method in teaching CEI in Geography in Yaounde VI Municipality.

4.3.1: Findings on Geography Teachers' Perceptions on Sustainable Pedagogic solutions to be adopted for an effective use of Hack Mindset Method in Teaching CEI.

Mohamed. M. Muchiri. (2021) reveals that some teachers had positive attitude towards the implementation of the CBA. Based on the analysis of this research, Geography teachers in the Yaounde VI Municipality have different views to a greater extent about the use of CBA methods. However, their level of perceptions has not been the same with respect to the pedagogic strategies to be adopted for the use of Hack Mindset method in teaching CEI in Geography. In order to determine their level of perceptions, respondents were asked to tick if they are for adopting a participatory pedagogic development approach (PPDA), ensuring a sustainable educational system, encourage the organization pedagogic seminars and CBA methodological modeling for a sustainable CBA teaching methods. From these options, the following data (Fig 4.5) obtained; 36% said there is the need for CBA methodological modeling of existing teaching method, 30% said organization of pedagogic seminars on the concept, enforcing key stakeholder's contributions, 20% said adopting a participatory pedagogic development approach (PPDA) while 14% said they were for a sustainable educational system.

Figure 4.5 was analyzed base on the Geography teachers' characteristics such as age group, longevity in service, level of training and school status. In terms of the characteristics, 28 respondents out of 79 were for CBA methodological modeling for a sustainable CBA teaching methods, 24 respondents out of 79 were for the encourage the organization pedagogic seminars, 16 respondents out of 79 were for the fact we should adoption of a participatory pedagogic development approach (PPDA), meanwhile the rest 11 respondents out 79 were for ensuring a sustainable educational system as sustainable pedagogic are all proposed solutions for enforcing hack mindset method in teaching CEI.

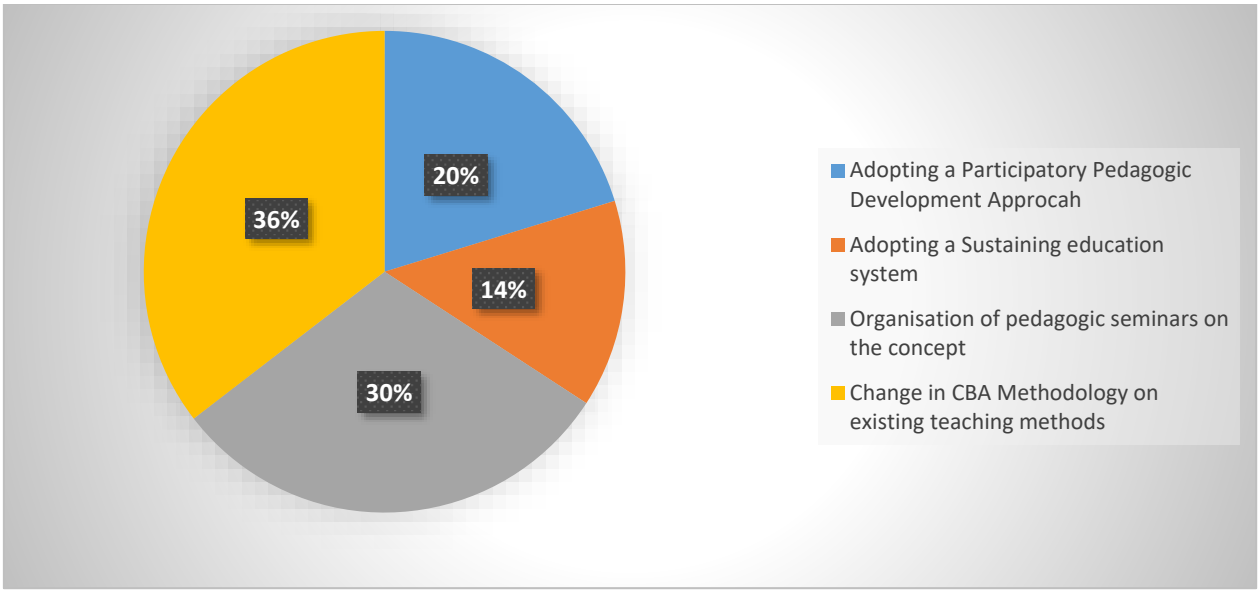

Figure 4.6: Respondents Perceptions on Sustainable Pedagogic solutions to adopted for an effective use of Hack Mindset Method in Teaching CEI.

Source: Author's Field Survey (2022)

This is because 60 respondents out of 79 see this method to new to them when testing their awareness because it is not included in their current scheme of work and have been working between 0-5 years and majority trained were still coming out from ENS Yaounde, Bambili and Maroua.

4.3.1.1: Hack mindset Methodological Model for a sustainable CBA teaching methods

On the whole, a holistic methodological model is proposed to Geography teachers in Yaounde VI Municipality which help teachers to be more familiar with in teaching CEI in Geography. Finding revealed that 28 respondents out 79 of about 36% were strongly for the fact that a new teaching methodological approach model should be adopted in Yaounde VI Municipality by setting out the agenda for total and holistic application of Hack Mindset Method. It is important to note that Hack mindset and Project Base Methods are modern CBA teaching methods which can be used to teach CEI in Geography via classrooms and outdoor field activities. The model seeks to instill CBA teaching learning approaches, techniques and possible ways these techniques can be used at each stage of lesson delivery (Fig.4.6). This fraction of Geography teachers of about 36% were emphasis on a modern methodological modeling procedures using Hack mindset method as framework method. The think the CBA teaching methods are more of teaching techniques than methods which are not clear for the teaching of Geography in general and CEI in particular.

Thus, they think adopting a holistic methodological model under two main teaching learning methods Hack mindset and PBL teaching methods (Fig 4.6) with many teaching approaches and techniques is a best pedagogic option. This is because both methods are student centered or constructivist approach. Finding from C. D. Jung and L.M. Dos Santos (2017) akin as mentioned previously, that critical thinking skills are essential skills that global citizens need in order to function in the 21st century and that one of the most effective pedagogical approaches encouraging higher-order cognitive skills is task-based or project based learning (PBL). PBL is based upon the social constructivist and collaborative pedagogical approaches to learning because of the "hands-on" or authentic learning which is a fundamental aspect of PBL, it is thus, highly suitable for it application in an Environmental education class. PBL gives students the opportunity to utilize higher-level cognitive skills as it requires them to apply the concepts they learned in class and create something unique with their acquired knowledge. This higher-order thinking corresponds to the highest level of Bloom's Revised Taxonomy of learning where 'creating' something is at the top of the pyramid during which critical thinking skills are employed.

The succeed of this propose strategies which can enhance the use of Hack mindset in teaching CEI in Geography using a holistic methodological modeling will focus more on teachers' training, and reorganization of CBA teaching methods, approaches and techniques in order promote a proactive CBA pedagogic framework regarding the teaching of CEI in Geography. And to solve the complex problem of poor mastery of CBA teaching methods and techniques which 21 respondents out 79 (26.58%) attested it is a serious problem could hinder the effective implementation of Hack mindset.

4.3.1.2: Organization pedagogic seminars on the New Concept of Hack mindset method in teaching CEI in Geography.

On the whole, professional development scheme is proposed to Geography teachers in Yaounde VI Municipality which could help teachers to be more familiar with the teaching of CEI in geography using Hack Mindset Method. Finding revealed that 24 respondents out 79 of about 30% were strongly for the fact that a frequent organization pedagogic seminars will improve on career development of Geography teachers in Yaounde VI Municipality. Through this pedagogic solution is aim at setting out the agenda for total professional development scheme were teacher are trained, taught on how to improved their career development for effective application of Hack Mindset Method (Plate 4.1). This finding tie with the previous findings on

challenges which states that 24 respondents out 79 revealed that inadequate knowledge on Hack mindset as a deeper learning teaching method is the first major challenge (Table 4.4) with about 30.37% accepting that it is a problem that could affect the use of Hack mindset in teaching CEI in Geography.

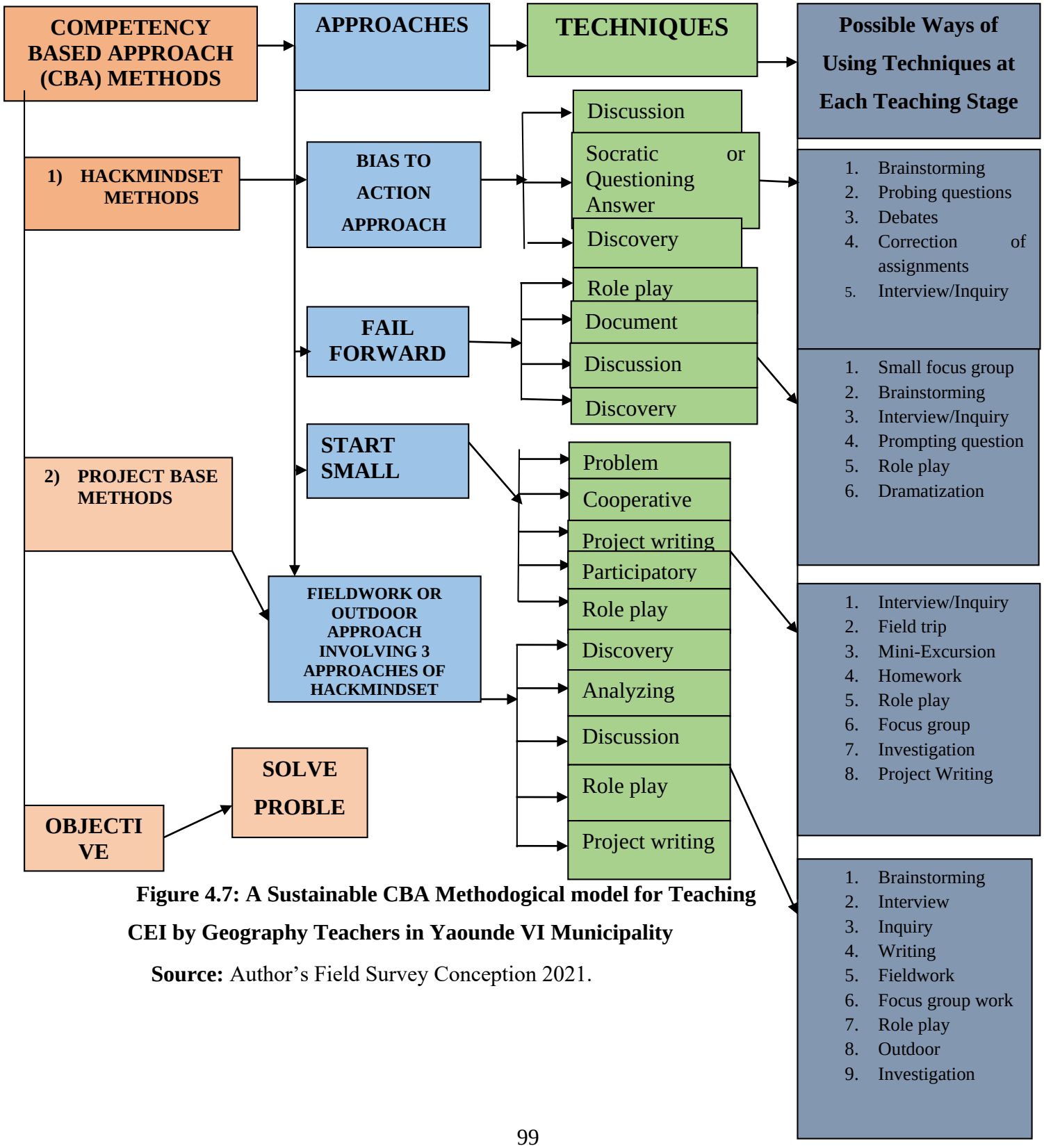

Figure 4.7: A Sustainable CBA Methodogical model for Teaching CEI by Geography Teachers in Yaounde VI Municipality

Source: Author's Field Survey Conception 2021.

Further finding revealed that an appreciable percentage of Geography teachers in private schools were not trained and most of them were just graduating from the training colleges before the CBA was introduced in the Cameroon school system. Majority (30%) attested to the fact that they acquired basic knowledge and skills of CBA through seminars, conferences and workshops which were not really frequent to keep them abreast with the dynamics in the art of the model in teaching. This collaborates to Wiysahnyuy. L. F. (2021) findings which states teachers need diverse professional development activities ranging from in-service training, from pedagogic seminars, conferences and workshops as well as individual research to adapt and use dynamic trends of CBA. In addition, their finding also makes mention of the fact that majority teachers found it difficult to implement the CBA because of inadequate knowledge and skills, overcrowded classrooms, limited teaching hours, the bogus nature of the syllabuses and insufficient pedagogic and learning materials which is related to finding of this study.

Photo 4.2: Field Evidence of Geography teachers of the Center Region taking lectures on PBL Method Photo A & B and how it can be use in teaching CEI link to weather changes Photo C While Photo D involved those who actually participate in the seminar.

Source: CERAGET Seminar 29 April 2023 in Mbamdumo Yaounde.

4.3.1.2: The Participatory Pedagogic Development Approach for sustainable Use of Hack mindset in Teaching CEI in Geography.

Findings from data collected indicate that pedagogic strategies must therefore be proposed to boast the teaching of CEI in Geography using new CBA Hack mindset method in Yaounde VI Municipality. 16 respondents out of 79 were for the fact that the most efficient strategy that has proven successful in most areas is the Participatory Pedagogic Development Approach (PPDA). PPDA is an approach that promotes teachers driven innovation through participatory processes and skills building involving experimentation and pedagogic workshops so as to allow small scale teachers who are either trained or untrained to make better teaching pedagogic choices about available CBA teaching methods (Plate 4.2). About 20% of the respondent are confident that these innovations could improve on the existing OBA and CBA teaching methods a PPDA.

Photo 4.3: Field Evidence of Participatory Pedagogic Development Approach platform initiated by Geography teachers of the Center Region on how to install weather instruments using teachers' experiments and experiences. Photo A = a Stevenson Screen, Photo B = a Rain Gauge, Photo C = Weather installation guide and Photo D = Teachers actively involved in PPDA.

Source: CERAGET Seminar 29 April 2023 in Mbamdumo Yaounde.

There are 5 major stages (Table 4.7) involved in PPDA that teachers could adopt when using Hack mindset method. Several studies have reported successes of PPDA in many areas in Africa and in Cameroon in the field agriculture an indicator that this will work in the education sector in the domain of CBA pedagogic teaching methods.

Table 4.7: The Procedure to Introduce Participatory Pedagogic Development to Teachers

PP Approach Agent	The Role of Pedagogic Agents	Benefits to Teachers
1. Learning from Teachers	• Identifying Teachers' innovations • Understanding Teachers Experiments • Getting insights into Teachers reality	Sharing of experiment amongst Teachers
2. Testing New Options in teaching	• Suggesting portions and ideas to teachers • Encouraging teachers to compare options and ideas with current practices	-Teachers are free to test, adapt or reject methods and technologies without pressure from pedagogic agent
3. Filling local gaps	• Enhancing Teachers' on resource management • Principles providing information on phenomena that Teachers cannot observe on their own	-Local way of applying Pedagogic principles to teachers
4. Facilitating mutual learning	• Facilitating the generation of insights and options within the community	-Critical exchange ideas amongst farmers -Minimal dependence on technology from outsiders
5. Improved experimental design	• Studying current methods of informal experimentation with teachers • Reaching an agreement with teachers on more systematic forms of and learning improved	-ways of experimentation -Position and confidence of development agents experimentation and teachers strengthened

Source: Adapted from UNDP (2006)

This finding akin with Tchawa finding, (2001) who carried a study in the grass fields" of the western highlands, precisely in Babanki on a Participatory Technological Development Approach (PTDA) experience on soil fertility improvement through "Night Paddock System" which resulted from the original idea initiated by the Babanki indigenous farmers themselves and improved upon by the PTDA agents.

The results of the study showed that more than 500 families in Babanki village adopted this innovation and this has led to development of other chains of innovations such as the contracts between farmers and cattle rarer, new harvesting tools, and developrnent of irrigation system.

Thus leading to a drastical increase in yields; huckleberry yields drastically increased by three folds than the previous yields as a result of improvement in night Paddocking system which was an initiative of the local population. Today Babanki is one the highest supplier of Huckleberries to the major towns of Cameroon like Bamenda, Douala and Yaounde. Another study cried out in western Nepal in South East Asia by Schumacher (2016) reported similar results whereby families in remote villages were struggling to sustain year round livelihood in vain through traditional staple crops of rice, ginger, and maize. A PTDA was initiated in communities and a 12-week program on alterative vegetable farming was conducted with village. Villagers were able to sell to experiment and plant new crops such as cabbage, tomato and onions. They were also able to produce excess produce that they could sell in the market which was an achievement and built up enthusiasm for experimentation and diversification (Schumacher, 2016).

However, these findings are drawn from the field of agriculture; any of this example can therefore be copied by educational stakeholders and teachers and introduced in Yaounde VI Municipality secondary schools using what the researcher call a Participatory Pedagogic Development Approach (PPDA) in teaching CEI in Geography using Hack Mindset, given their influence in the Municipality. Study revealed that the other stakeholders and Geography teachers face a major challenge in the domain of education especially the teaching sector base on wrong interpretation of teaching CBA methods. The study therefore proposes sustainable measures to boast the teaching sector in term of method selected to be used Plate 4.2.

4.3.1.3: The State must enforce a Sustaining education system

The data collected from seventy-nine Geography teachers of 13 secondary schools in Yaounde VI Municipality base of research question attest that the most efficient way of enhancing the used of Hack mindset is through a sustaining education system. 11 respondents out of 79 about 14% were for adopting a sustaining education system. In fact, researches from other area shows that an inspiring and informed teacher on new CBA teaching method is the most important school-related factor influencing student achievement, so it is critical to pay close attention to teachers' conditions and qualities. Improvement in teacher's conditions, improves the quality of teaching leads to efficiency (Fig.4.5). This, coupled with improved pedagogic resources creates an enabling teaching-learning environment for the use of Hack mindset in teaching CEI in geography. UNESCO (2006) finds out that improving on the teachers' condition in term of training and technical know-how depends on a sustaining education system. These important

inputs cumulatively lead to effective teaching and learning process. This will fully depend on the contribution of key stakeholders in education in Yaounde VI Municipality who should ensure a comfortable working conditions for the teaching CEI in Geography with more attention on students' development of competencies.

The outcome from this system will include; valuable knowledge, skills, encouraging attitudes and hobbits. This will cumulatively lead to quality results, and consequently attracts the attention of parents who will then follow up their children in school and at home. Increase in enrollment leads increase in income through the payment fees. This income can then be reinvested to the system and the process will be sustained. The Proprietors of private schools and the state should represent the foundation of the sustaining educational system aim at enforcing the use of Hack Mindset teaching method. State should enforce educational policies through the Ministry of Secondary Education, assists and subsidies private schools financially and provides other scares resources which the private schools may find it difficult to acquire like the training of teachers via seminars and workshops. This, in turn, implies that effective teacher education programs on new CBA teaching methods should be part and parcel of any sustainable educational system that aims at the creation of innovative and critical-minded future citizens (UNESCO, 2006).

The state should equally supervise the activities of government and private schools via inspection of teaching learning activities base on CBA method used. The state must equally ensure that the staff are qualified and up to the task by supervising lay private educational institutions for effective teaching. The proprietors of these lay private schools and principals of government schools should assume the management of school resources, administrative staff and the Geography teaching staff and equally controls the schools. The proprietors and principals should equally give feed back to the state on the functioning of the schools. Hence, the relevance of this framework therefore lies in the fact that if adopted in Yaounde VI Municipality it will go a long way to address the problems of teachers since the state will have to ensure the presence of trained teachers with required qualification. The problem of salaries will equally be addressed as there will be maximum interaction between the state and the schools. This will then enhance the system and increase enrollment from where more income will be generated from fees and reinvested back in to the system. This will therefore ensure sustainable use of Hack mindset method in teaching CEI in geography.

From the above findings over 80% of the respondents said for these pedagogic strategies to be fully put in place to ensure the use of Hack mindset method in teaching CEI in Geography in Yaounde VI Municipality it will depend solely on a sustainable education system guided by the role play by exist education stakeholders and their contribution in building a sustaining education (Fig 4.5). As a result, the study proposes the training of teachers and reorganization of CBA teaching method, approaches and techniques under Hack mindset method as major solutions for teachers to use a holistic methodology, organization pedagogic seminar, role of state as a main policy maker in a sustaining education system starting from the primary to secondary and university which should be based on Hack mindset method.

4.4: Legal framework put in place by Educational Structures and key Stakeholder's contributions for effective implementation of Hack Mindset method under CBA in Yaounde VI Municipality.

This data collected revealed that seventy-nine respondents were strongly for the fact that in-depth evaluation of the policies, and efforts put in place by the educational structures is very vital for the usage of Hack mindset method. These key Stakeholders include; public and private educational structures, Schools personnel, Geography students and other actors such as Parent Teacher Association (PTA), Non-Governmental Organizations (NGOs) and Local Council Stakeholders. Their contributions will be evaluated base on policies and efforts put in place that could ensure the effective usage of Hack mindset method in teaching CEI in Geography. Base on the sustaining platform put in place by stakeholders for effective pedagogic implementation of future CBA teaching method called Hack mindset, respondents were asked to choose from public educational structures, schools personnel, Geography students, and others. Result were presented in the form of tables. The following results were obtained (Table 4.8) 50,63% confirm it is public educational structures, 25.31% were for school personnel, 12.67% agreed it is geography students while 11.39 were for others.

Table 4.8: Stakeholders contributions toward CBA and effective implementation of Hack Mindset Method in teaching CEI in Geography.

Categories of Stakeholders	Frequency	Percentages (%)
Public Educational Structures	40	50.63
School Personnel	20	25.31
Geography students	10	12.67
Others	09	11.39
Total	**79**	**100**

Source: Field Survey 2022

- **The Public Educational Structures:**

Findings revealed that, both public and private educational structures play a key role in enforcing legal framework which help in the future implementation of Hack mindset method in Yaounde VI Municipality. From the analysis of the activities of government and private structures in the area under study, it confirmed that, both structures have contributed about 50.63% in the use of any CBA teaching method in teaching CEI in geography and Hack Mindset Method will not be an exception. About 40 respondents out 79 agreed it is Public educational structures (Figure 4.7).

Photo 4.4: Ministry of Secondary Education in Yaounde as main stakeholder

Source: Inforscourseducation. www.minesec (2022)

However, their level of contribution has not been the same, some structures contributed more than others in terms of policies and pedagogic efforts. In order to determine which, structure contributed more, in enforcing pedagogic CBA Legal framework within Yaounde VI Municipality for effective Hack mindset implementation**,** respondents were asked to tick the structures with the highest contribution and the following results (Table 4.7) were obtained; 46.83% of respondents accepted that it is MINESEC that contributes the highest, another estimated 30.37% confirmed it is government and private schools while 22.8% agreed it is the Mfoundi Divisional Delegation of education.

Table 4.9: Respondents perception about educational structures contributions to the use of Hack Mindset Method in teaching CEI in Yaounde VI Municipality.

Structures	Frequency	Percentages (%)
MINESEC	37	46.83
Mfoundi Divisional Delegation	18	22.8
Schools	24	30.37
Total	**79 Respondent**	**100**

Source: Field Survey (2022)

Findings from table 4.9 indicate that MINESEC is the highest contributor. An estimated 37 respondents out 79 confirmed that this is probably because in terms of function and pedagogic activities, MINESEC defines, planned, evaluate, adopts and follow up government policies in the teaching and learning using CBA approach. MINESEC also provides infrastructures, pedagogic didactic materials, vital pedagogic documents, computers, engage teachers and students in distances learning, prepare, organize and facilitate pedagogic seminars in CBA teaching method of teaching CEI in the future.

Findings revealed that Schools occupies second in term of contribution. About 24 respondents out of 79 attest that government and private schools contribute the second because their main function is to interpreting educational teaching curriculum and respect pedagogic policies enforcing the smooth implementation of the curriculum using official textbooks, scheme of work, syllabus and the used of new CBA teaching-learning methods. Meaning while, Mfoundi Delegation contribute the least with 18 respondents out of 79 confirming that it is because their main functions are closely link to that of the officials of MINESEC and so they only contribute in monitoring and enforcing the policies designed by MINESEC and give feedbacks. Moreover, delegation only come in to supervised with little or no follow up for future effective

implementation of Hack mindset method in teaching CEI in geography. This is in line with a report on Deeper learning by the William and Flora Hewlett foundation (2015) in the United states of America which reports that the central office of education contributes greatly in defining, planning, adopting, supports Commission of education and schools to enable students realize ambitious learning goals.

- **Schools personnel:**

Findings on the contribution of school personnel in the use of Hack mindset method in Yaounde VI Municipality is based on the activities of school Principals, the Geography teaching staff and others. Findings revealed that they have contributed greatly to the implementation of CBA using modern teaching methods in the teaching of Geography in Yaounde VI Municipality. However, their level of contribution has not been the same, some schools' personnel contributed more than others in terms of directing educational policies and enforcing pedagogic options. In order to determine who contributed more, respondents were asked to tick the school personnel with the highest contribution. The results (Table 4.10) were obtained as; about 60.75% (48 respondents out of 79) confirm that the Geography teachers and head of departments in Geography (HODs) have contributes the highest, an estimated 39.25% accepted it is the principals while 31 respondents out of 79 confirmed it is others.

Table 4.10: Respondents Perception of Schools Personnel contributions to the use of Hack Mindset Method in teaching CEI in Yaounde VI Municipality.

Schools Personnel	**Frequency**	**Percentages (%)**
Principals	21	26.16
Geography Teachers	48	60.75
Others	10	13.09
Total	**79**	**100**

Source: Field Survey (2022)

The findings revealed that highest contribution with 48 respondents out 79 accepted it come from Geography teachers because they are the focus point to interpret and implement the curriculum designed by MINESEC. Findings also revealed that principal contribution is second with 21 respondents out of 79 agreed that most principals have as main function to direct, designed academic calendars and provide necessary didactic materials that will ensure that teachers and students are actively involved in the teaching-learning process through the usage of Hack mindset method. This concurs with the findings of Honig et al. (2010) who found out

that principals serve mainly as supervisors spending the bulk of their time engaged in tasks such as monitoring schools' compliance with federal state and district policies, running interference for ineffective central office units, and conducting principal evaluations unlike teachers who actually does the teaching. Meanwhile other stakeholders involved the Discipline masters with about 10 respondents out 79 accepted this fact because their main function is to assist in maintaining discipline in schools for effective teaching to take place.

Furthermore, findings show that geography teachers are the highest because as they play an instructional role, interactive role, serves as mentors, supervisors and councilors so as to facilitate students learning of CEI through Hack mindset method. This is in line with a report on Deeper learning by the William and Flora Hewlett foundation in 2015 in the United States of America which reports that the central office of education contributes greatly in defining, planning, adopting, supports Commission of education and schools to enable students realize ambitious learning goals meanwhile teachers are more involved in delivering knowledge base on how they are designed under a given approach.

Our study equally reveals that Geography teachers level of contribution varies from one school to another base on the level of training. Respondents were asked to tick if they were trained or untrained and the following responses were obtained (Figure 4.8); 55 respondents out of the 79 confirmed that they were trained meaning 69.62% were trained against 30.38% who were untrained (24 respondents out of 79). Findings indicates a high contribution will come from trained geography teachers in the usage of Hack mindset teaching method in teaching CEI in geography with a high utilization in government schools. This is because, the ratio of trained and untrained is very high in private schools than government schools in the area study where 36 respondents out of 50 Geography teachers in private schools were trained and the remaining 14 untrained with a ratio of 69:32 meanwhile in government schools there was a higher ratio where 19 Geography teachers out 20 were trained given a ratio of 96:04 for untrained Fig 4.8. Angelo Edward Kavindi (2014) postulates that teacher educators in public teacher's college demonstrated a high level of academic qualification than their counter parts in private teacher colleges. Also teacher educators in both colleges showed that they were knowledgeable on participatory methods but the practice in the classroom was dominated by non-participatory methods contrary to the suggested competence-based teaching approaches.

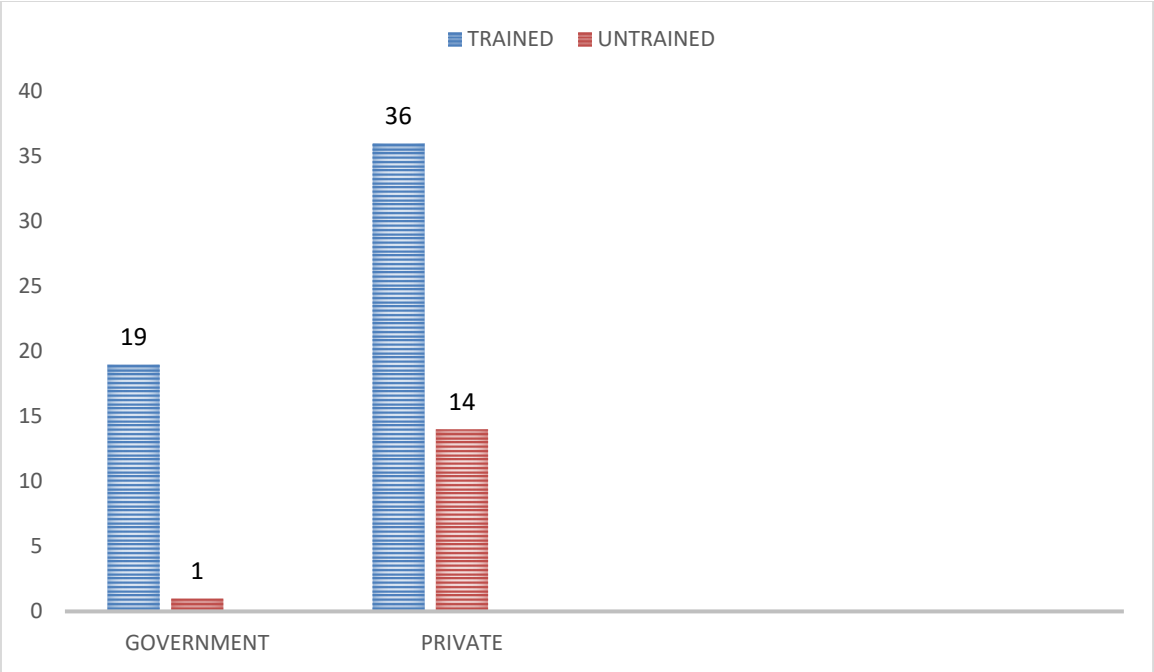

Figure 4.8: Respondents perception Geography Teachers Trained and untrained and their contributions to the usage of Hack Mindset method in Yaounde VI Municipality.

Source: Field Survey 2021.

This finding revealed that in Yaounde VI Municipality schools has the abilities to research and attend seminars in order to adopt and adapt to new CBA methods like Hack mindset method with a high contribution when it comes to the teaching of CEI in Geography. Detail findings indicates that majority of the Geography teachers are actively teaching, with 69.62% trained and 30.38% untrained indicating that teachers who are trained may contribute more in the used of Hack mindset method in teaching CEI in Geography. Trained Geography have the abilities to interpret and enforce the implementation of the teachable curriculum. An estimated 21.4% untrained teachers are faced with the problems of interpreting and implementing CEI in Geography using the new Hack mindset teaching method. The findings of Nuwategeka et al (2020) agreed that the training of Geography teachers at Gulu University in Uganda with the view of assessing the application of contemporary Geography teaching methodologies for the twenty first century learners. He also found out that there is need for adjustments in teacher training to meet the needs of the contemporary learners thus; they recommend that the curriculum structure of future Geography teacher trainees be improved as a factor in contemporary teaching styles which use modern teaching equipment relevant to the current generation of technology and learners, and the training.

- **Geography Students**

The main objective is to examine the contributions of students to the used of Hack mindset method in the teaching and learning of CEI in geography in Yaounde VI Municipality. Finding shows that geography students significantly contribute at each level of in the used of Hack mindset teaching learning approaches. In order to ascertain the effective contribution of students, respondents were asked to tick to describe the extent to which students' contributions were considered by geography teacher at each level of implementation (Table 4.11). The following result obtained; 87.34% with 69 respondents out of 79 said they gives assignments to students following the Bias to action approach even though ignorant but applying the approach, 62.03% with 49 respondents out of 79 said during the fail forward approach the provide their students with guideline questions to help students construct knowledge that is why they were aware not since they were rather giving guided answers to questions while 81.01% with 64 respondent out the 79 do engaged their students into CEI creative projects during and at end of their lessons under the start small approach.

Findings from the respondents show that students have contributed at different approaches in Hack mindset method because their teachers involved them in the use of Hack mindset method. For example, in terms of using the Bias to action approach, students are directly engage in the teaching-learning process through assignment as a Hack mindset technique. About 87.34% of the respondents give assignment to students to enforce the Bias to action approach ignorantly. This is because students are the target in using Hack mindset method in teaching CEI in geography. Also, in using the fail forwards approach, after giving assignment 62.03% drill their students to construct knowledge on their own using guideline questions given by the teacher not more as a facilitator. The fact that students are at the center teaching and learning, findings indicates that about 81.01% of teachers engage their students into the project writing and CEI creative activities such as clean-up campaigns and sensitization talks on CEI during start small approach indicating that the students also contribute fully in using Hack mindset.

Table 4.11: The involvement of Geography students in the used of Hack Mindset Approaches by Geography teachers in Yaounde VI Municipality

Teaching Approaches	Geography Teachers and students involvement	Frequency	Percentages %
Bais to Action	Teachers who Give assignment to students	69	87.34
	Teachers who do not give assignment to students	10	12.66
Fail forward	Teachers who engage students by giving guideline questions after assignment were done	49	62.03
	Teachers that used oral explanation or provide guideline answers to students.	30	37.97
Start small	Teachers that engage students into CEI lesson via creative project at the end.	64	81.01
	Teachers that do not engage students into CEI lesson via creative project at the end.	15	18.99
Total		**79**	**100**

Source: Field Survey 2022.

This finding correspond with Kober *et al.*, (2010) who confirmed that federal and state policymakers as part of a broader strategy to ensure that all students graduate from high school ready for college and career. They emphasized that learners should be placed at the center of the teaching and learning process in order to promote rigor and quality outcomes. However, 75.95% of the respondents (60 respondents out of 79) do not respect all the three (03) approaches because they were ignorant and these group of teachers see students as an empty vessel and do not give assignment and if any, these group of teachers will provide guided answers to assignment and to them engaging students into CEI creative activities is time waiting indicating less contribution from students.

- **Other Stakeholders**

The study equally reveals that apart from the state, school personnel and students, there are other stakeholders. The main objective is to examine contribution of other stakeholders in the used of Hack mindset method in the teaching of CEI in geography. They include; Parent Teacher Association (PTA), Non-Governmental Organization (NGOs) and Council. Their contributions vary greatly as the respondents were asked to tick and described the extent with which each other stakeholders contribute. The following responses (Fig. 4.9) were obtained;

50% confirmed that PTA is the highest, about 28.6% were for NGOs with moderate contribution meanwhile about 21.4% agreed it is just normal contribution for the council.

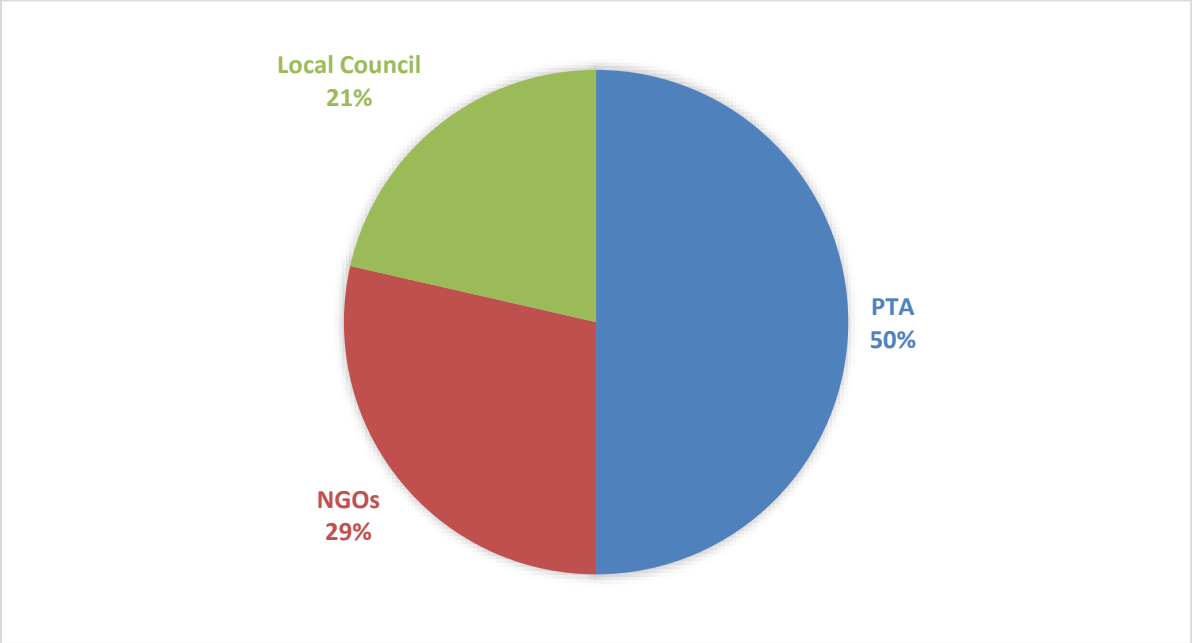

Figure 4.9: Other Stakeholders contributions to use Hack Mindset Method in teaching CEI in Yaounde VI Municipality.

Source: Field Survey 2022.

Findings from respondents revealed that other stakeholders have significant variations in their contributions in the used of Hack mindset method in teaching CEI in geography. Generally, majority of the respondents agreed, its PTA or parents who help students to pay school fees, buy official textbooks, devices, assist students at home in doing their CEI assignments, sensitize other parents on their role in children education. This finding is in line with Justin. S. *et al.*, (2021) who confirmed that Parents as educational stakeholders provide additional resources for the school to assist student achievement and to enhance a sense of community pride and commitment, which may be influential in the overall success of the school.

Another findings shows that the NGOs come second amongst the other stakeholders because out of the 13 sample schools, 08 actively involved in NGOs activities such as environmental education, sensitization of students on the forms and dangers of environmental degradation, create awareness for the respect for International Days set-aside for the environment, finance project writing on environmental issues and provide pedagogic devices that can aid the teaching

CEI using Hack mindset method like AFROGIVENESS, ‘‘MY WORLD WITH NATURE’’ and HEALTHi FIRST (Plate 4.3).

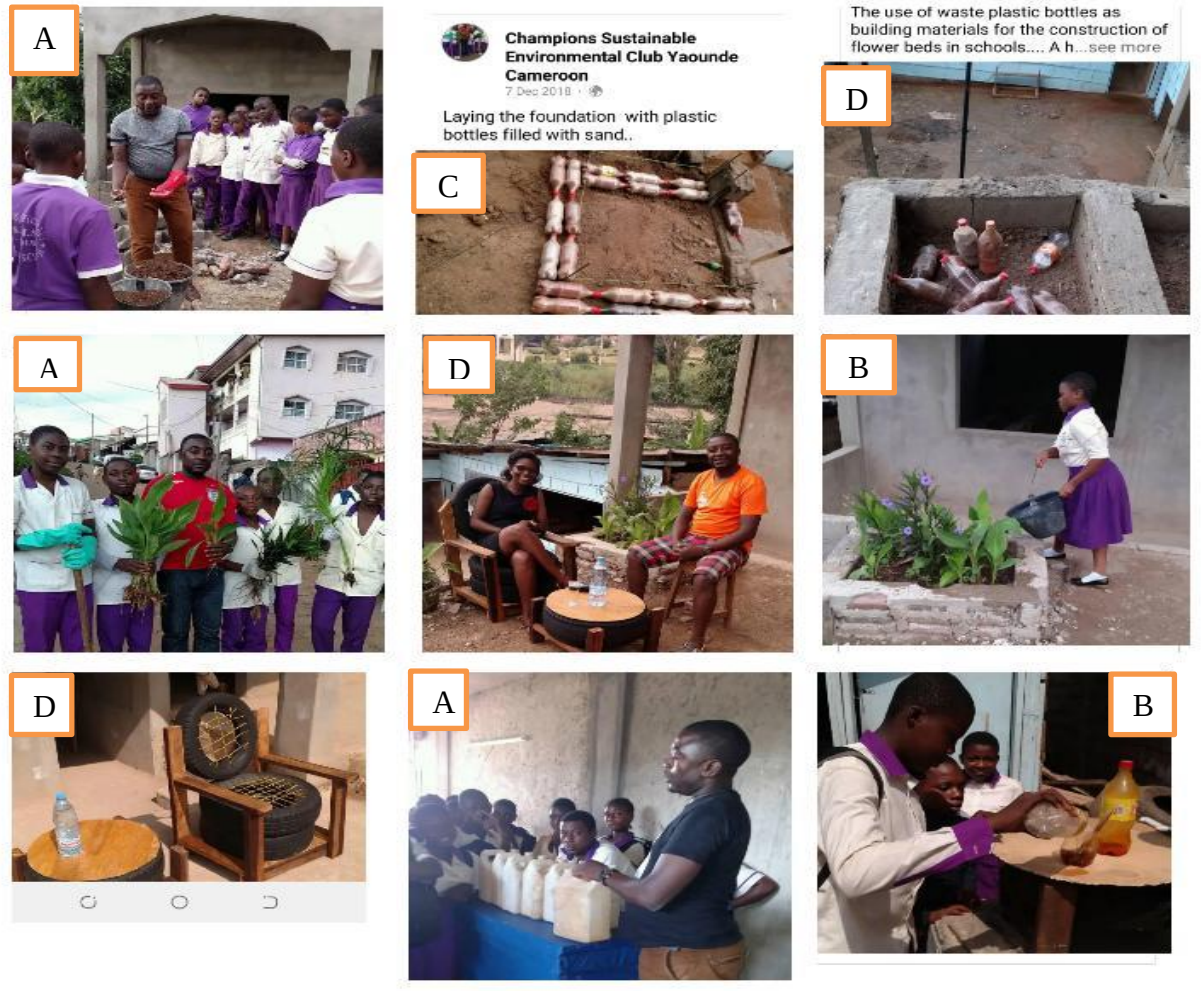

Photo 4.5: Champions Sustainable Environmental Club in Partnership with an NGOs ‘‘My World with Nature’’. Hacking Students Minds using Hack Mindset Method in Solving Environmental Issues. **Photo A** = Teacher as a facilitator, **Photo B** = Students-Center Approach, **Photo C** = Plastic waste recycling, **Photo D** = Finish products from recycling waste.

Source: Field Survey on the application Hack Mindset Method by the researcher.

This finding is corroborated by the findings of Mosweunyane. D. (2019), which states that NGOs are useful instruments for learning generally, but particularly they serve as vehicles for lifelong learning. Another finding highlights the fact that NGOs have established the earliest schools in Botswana when it was found that schools alone were not enough to take on the challenges of a Botswana that was growing more complex by the day, NGOs began to complement school learning with specialized training in centers for vocational and professional development. The Government of Botswana came to support NGOs through the development

of an NGO policy whose aim is to forge a closer government-NGO cooperation in the promotion of lifelong learning in the country.

Finally, finding show that the Local Council contribute 21.4%. Respondents think the local council contribution is the least because they are more concerned in outdoor activities like partner with schools to organized clean-up campaigns on Fridays, sponsor school related environmental projects proposed like Environmental Impact Assessment on schools and community life. Also, the community and their local councils up holds and transmits the right values and attitudes to our young, recognizes the variety of abilities and talents displayed by our young and sees the worth in each child, offers scholarships and bursaries to students and teachers, provides support to families and students who are in need of assistance (stakeholders in Education 2013)

4.5: Conclusion:

This chapter made a description of findings, analysis and a discussion of result. Emphasis was placed on the **Categories of perceptions** found in the Geography teachers about the usage of Hack Mindset Method in teaching CEI in geography. The main objective was to answer the first research question which states ‘‘what are the perceptions of Geography teachers about the use of Hack mindset method in teaching CEI in Geography within Yaounde VI Municipality? These categories are; Ignorant, aware not using and aware using. Out of the three categories, Ignorant was the first category 148 occurrences which was completely visible amongst teachers of the Yaounde VI Municipality. The next category is the second category that was highly blended with one category aware using with 69 occurrences and the other third category was aware not using with about 58 occurrences.

Another emphasis was placed on the **Major Challenges** Geography teachers are going to face when implementing Hack Mindset Method in teaching CEI in Geography. The main objective was to answer second research question which states ‘‘what challenges are Geography teachers going to face when implementing Hack mindset method in teaching CEI in Geography within Yaounde VI Municipality? These challenges are, Inadequate knowledge on Hack mindset method rank first with 24 occurrences, second was poor mastery of CBA teaching methods with 21 occurrences, third was inadequate didactic materials with 20 occurrences and fourth was consider as others challenges with 14 occurrences.

Lastly, emphasis was placed on the **Major pedagogic options or solutions** which geography teachers are going to adopt when implementing Hack Mindset Method in teaching CEI in Geography. The main objective was to answer third research question which states ‘‘what pedagogic solutions or options can sustainably help teachers to effectively implement Hack mindset method in teaching CEI in Geography within Yaounde VI Municipality? These Pedagogic options or solutions are; proposing a new CBA methodologic modeling of existing teaching methods which is rank first with 28 occurrences, second was the organization of pedagogic seminars on Hack mindset concept. It is rank second with 24 occurrences, third was adopting a PPDA with 16 occurrences and fourth was all about enforcing a sustainable educational system with 14 occurrences. In line with the pedagogic options, **Stakeholders** who can contribute more in the smooth implementation of Hack Mindset Method were identify as; Public educational structures contribute more rank first with 40 occurrences, Schools Personnel was rank second with 20 occurrences, geography students rank third with 10 occurrences and fourth consider as others with 09 occurrences. The next chapter of our work, will be concerned with an overview of the entire study, pedagogical implications of this work, recommendations and suggestions for further research.

CHAPTER 5:
GENERAL CONCLUSION AND RECOMMENDATIONS

5.0: INTRODUCTION

The present chapter makes an overview of the chapters of this study. It further discusses the pedagogic implication of the study, it makes recommendations and suggestions for further research.

5.1: AN OVERVIEW OF THE STUDY AND SUMMARY OF FINDINGS

The purpose of this study was to investigates the perception of Geography teachers on the use of the Hack Mindset method in the teaching of Contemporary Environmental Issues (CEI) to Geography students. A case study was drawn from Secondary Schools in Yaoundé VI Municipality of Cameroon, with the analysis of seventy-nine sampled Geography teachers, chosen at random from thirteen secondary schools of the study site. It is an attempt to show the point of views of Geography Teachers on the use of the Hack Mindset teaching method as one of the many course design practices of the CBA that can competently transform learners into useful development agents.

This study made used of data collection instruments such as questionnaires, interviews, focus group discussions and personal observation for the investigation. Data collected was sorted manually and treated using Microsoft Excel 2007. The data obtained was analyzed using qualitative descriptive and quantitative statistical methods. At the end of the analysis, there were three key major findings of the study base on the sampled of seventy-nine Geography teachers.

The first major finding revealed that about 75.95% of the sample population were ignorant of the Hack mindset method and it approaches in teaching CEI in Geography and only 24.05% was aware of the method with little usage since it is a new CBA method not included in Geography official scheme of work. Out of the three Hack mindset approaches there was a slight increase for those that were aware using start small approach of about 35.45% given the fact that teachers were introduced into the new CBA PBL method during pedagogic seminars. A very high ignorant rate for both Bias to action approach with 63% ignorant and fail forward approach with 73.41% ignorant because they could not adapt to a very recent concept and teaching using new CBA methods, but were more familiarity with OBA. Another sub-finding revealed that despite the 75.95% ignorant perception of the concept, 82.27% think that adopting

Hack mindset method with it little usage in teaching CEI in geography is a positive pedagogic option than a negative one. Thus, research hypothesis one was accepted which state that ‘‘Geography teachers are having a positive perception about the use of Hack mindset method in teaching CEI in geography despite the high rate of ignorant of about 75.95%.

The second major finding of the study revealed 30.37% of sample population was for the fact that inadequate knowledge on Hack Mindset Method and its approaches is the major difficulty teachers are going to faced. Also, findings show that 26.58% of sample population was for poor mastery of CBA teaching methods and CBA teaching techniques in general as second major difficulty while about 25.31% consider inadequate didactic materials as third major challenge and 17.74% were for others difficulties. Thus, research hypothesis two was rejected which state that ‘‘inadequate didactic materials and technical know-how are the major difficulties Geography teachers are going to face when implementing Hack mindset and its approaches in teaching CEI in geography.

The study concludes with third major findings in domains of major pedagogic solutions to be adopted and to identify the major stakeholders that have contributed so far in laying down a smooth platform for the future effective implementation of Hack mindset method in teaching CEI in Geography. The third finding revealed three pedagogic solutions as major pedagogic options to be adopted and about 36% propose that a reorganization of CBA teaching methods under Hack Mindset and Project based teaching-learning methods appear to be an imperative for the development of life-skills in learners to solve environmental problems, another sub-finding of about 30% were strongly for frequent organization of pilot seminars to lecture teachers and workshops for training teachers on how to adapt with Hack mindset method in teaching CEI in geography while 20% advise for the adoption of a participatory pedagogic development teaching approach which enhance learning from one teacher to another as it help them in testing new option in teaching, in filling local gaps, facilitating design amongst teachers. Thus, research hypothesis three was rejected which state that sustaining education system is the most sustainable solution to be adopted for the effective used of Hack mindset method in teaching CEI in geography despite the large contribution coming from the state under MINESEC.

Finally, finding also revealed that public educational structures dominated by MINESEC contribute more of about 50.63% in laying a smooth platform for the effective implementation of Hack mindset method since she defines and design policies that enhance CBA teaching

methods. Further finding indicates 25.31% think school personnel dominated by geography teachers contribute second because they are in charge of translating policies defined and designed by the Ministry into pedagogic outcome in the present of the students as the focus. More contribution came from the trained teachers than untrained because they highly ignorant of the Hack mindset method.

5.2: PEDAGOGIC AND DIDACTIC IMPLICATIONS

In this way, this study has many innovating pedagogic and didactic implications in seven (08) main dimensions such as:

- **Policy Deliberation and Decisions making**

This study will guide policy decisions makers and experts in diverse educational disciplines and ministries to reflect on the realities or context of Cameroon. Given the prospects of teaching Geography for environmental purposes, the logical result is that policy deliberation and decision making on CEI could favour the implementation of hack mindset teaching-learning approaches in other disciplines and teachers' teaching training curriculum. It is impossible to deny the fact that this study could open room for professional debate in teaching and training cycles across LICs and Cameroon in particular.

- **Programme Content Reconstruction**

Another significance of the study resides on the fact that it unavoidably will give rise to radical programme contents rethink or restructuring on CEI content in order to be consistent with the subjective acceptability of the training programmes. By this, we mean that the goals of the training programmes in Cameroon which is not consistent with the expected teaching-learning outcomes not fully achieved, would be reconstructed based on context of this study areas.

- **Methodology Reconstruction**

This study on teaching method and teaching approach will evidently be deconstructed from an OBA teaching-learning methods of CEI into new methods of teaching-learning CEI will be reconstructed. Thus, this study will constitute a substantial resource base that teachers can take home, read and make practical applications of the rich ideas generated by its theoretical construct. By this, it enables teachers to keep away their traditional approaches in teaching CEI. It will enable interdisciplinary cooperation with teachers of other disciplines as well as experts in complex environmental-oriented professions as a strategy for producing quality innovation during CEI lessons. Also, it enables Geography teachers to be facilitators and active resources

persons who can foster community reflection on the need to improve on the quality of life of individuals and their communities as a whole. This study will be useful to educational researchers on the new pedagogic approach called CBA especially teachers who want to increases their stock of scientific knowledge on Hack mindset teaching-learning approaches and other methods used in the CBA.

- **To Enhance Educational Professionalization**

The findings from this study will be beneficial for the professionalization of education in Cameroon. Thus, this study will be very useful to teachers in training colleges and academic institutions. Through this study, training schools involve in the training of teachers will orient their training programmes towards professionalization in the domain of environmental management in Cameroon. In this rather, the study will help student teachers in training schools as well master students in the areas of environmental education to be able to teach CEI lessons using skill and competencies. With these skills and competencies acquired, they will be able to impact on student studying CEI lessons in geography to be able to identify real life environmental problems in their communities and solve them with the skills they acquire during CEI lessons after school. Again, to the teachers and learners, this study will help teachers to update their teaching techniques within the CBA and enhance the learner's understanding of some contemporary practical environmental issues.

- **It Foster further supervision in training schools under cooperating Teachers**

The findings of this study will encourage further supervision of cooperating teachers in the training processes of student-teachers since majority cooperating teachers are not competent and well trained in CBA teaching method. This is support by finding of Chu. A.M. (2018) where it was realized that the supervision of teaching alone cannot effectively predict teachers' effectiveness under CBA and it was recommended that more emphasis during teacher training should be laid on subject matter and teaching methods mastery by student-teachers and also on a proper selection of supervisors and cooperating teachers to ensure that only the most qualified are assigned to guide and supervise student-teachers on CBA teaching methods.

- **It will foster academic development of students and textbook writers.**

This study will equally prepare students for future higher academic education and specific environmental field of study to specialised. It will also contribute in being an eye opener to textbook writers at the secondary school level. They will see the importance of Hack mindset

method in teaching pressing environmental issues as the incorporate exercise at each level of the approaches of Hack Mindset Method.

5.3: RECOMMENDATIONS

Considering the importance of solving rising environmental problems in our society today, it is important that recommendations be made for the improvement of teaching CEI in geography in secondary schools by adopting a more sustainable CBA teaching method like the Hack Mindset Method.

5.3.1: Recommendations on Practical Pedagogic Major Challenges

In an effort to minimize the issue of inadequate didactic materials, 20 respondents out of 79 hold that, the state and school proprietors could improve the usage of Hack mindset method. This can be achieved by improving on working conditions of teachers through the provision of required didactic resources especially in the two government schools. Also, the state should support private school proprietors with the required didactic resources needed for the effective realization of using Hack mindset in teaching CEI in Geography. Thus, all state supervisory bodies for education can do regular follow-up in order to give feedback about the state of didactic materials availability.

To add, the problem of limited Knowledge and poor mastery of CBA teaching methods, approaches and techniques was identified. In this line, about 71.4% recommended that the services in charge of education and capacity building of teachers should initiate regular in-service training via pedagogic seminars/workshops especially in private schools. So as to update and make teachers familiar with fast changing modern CBA teaching methods in the teaching of CEI using Hack mindset method as the main method.

Furthermore, teachers are equally encouraged to carry on further research on recent CBA changing teaching methods and also to be part of the working teams in connection with the changes in teaching and learning field. This is so because they are the ones expected to implement these designed methods. According to Mohamed Moses opinion, early preparedness would encourage teachers to be proactive in initiating subject dialogue in order to increase their experience hence, enhancing the implementation of the CBA. A further suggestion is that a comparative study on other social science teachers' preparedness for the implementation of the CBA should be fostered.

On the aspect of poor mastery of CBA teaching methods and, as accepted by 60% of our respondents, the researcher is suggesting for a reorganization of the Geography Pedagogic Harmonized schemes of work and syllabuses of 2014 and 2019 respectively for a clear CBA teaching methodological approach clearly stated in Fig 4.6. The study therefore, proposes Hack mindset teaching method and the incorporation of Project Based Learning (PBL) for social sciences with emphasis on CEI in Geography to be specific in Cameroon schools and colleges.

In line with limited infrastructures and overcrowded classrooms and, mindful of the need for the effective use of the Hack mindset in teaching CEI, the state and private school proprietors should increase the number of classrooms, continue to pursue the shift system in over populated schools, train and employ more private and Government teachers. Also, they should additionally provide educational devices like computers, Wi-Fi and Google search engines and projectors to facilitate teaching in difficult situations even for remote learning using E-Learning approach.

To school Principals, a conducive and friendly teaching learning environment should be instilled for effective use of CBA Hack mindset method. Additionally, lesson durations should be stepped up from 50 minutes to one hour per period. The essence is to give enough time for teachers to fully interact and make use of all the approaches and techniques spelled out in their lesson plans. To expedite the teaching of CEI, the state and proprietors must take the payment of teachers seriously and ensure salary increase, provide research allowances and motivation through the provision of incentives which will help facilitate the use of Hack mindset method in teaching CEI.

We recommend too that for effective usage of Hack mindset method in teaching CEI in Geography, educational stakeholders should be integrated into the development education agenda of Yaoundé VI Municipality. Therefore, it is hoped that all proposed practical strategies made during this study be adopted, for example, a PPDA, a sustainable educational system, adopt and reorganize CBA teaching methodological approaches for social science subjects like Geography, Economics, and others using Hack mindset method as a foundation model.

As indicated on (table 5.1), they should be a pedagogic restructuring of the log book to adapt with this new CBA Teaching method. Therefore, a revisit of the log book of teachers; that is the manner in which lessons taught are registered in the log book should be harmonized for all schools. This will really facilitate the usage of CBA and Hack mindset method especially Geography CEI lessons and serve time for the filling of complex log book and follow-up.

Summarily, majority respondent proposed that the CBA should be one of the core themes in the teacher training schools where emphasis is laid on the practical not just the theoretical part. Some were of the opinion too that job training should be implemented especially for those who had no formal training on the approach. Others indicated that there should be regular seminars and workshops in schools to improve on teachers‟ skills and knowledge on the CBA. Some also specified that the student-teacher ratio should be reduced and this can only be done by training more teachers especially in those fields with many students.

Another remedies of the challenges of using instructional materials are the organizing of training and workshop for teachers on how to use instructional materials, provision of funds by the authorities and government, regular supervision, the improvisation of the local materials and the provision of the various instructional materials which are necessary for the teaching of CEI in geography using Hack Mindset Method.

5.3.2: Recommendation on the practical Use Hack mindset method teaching CEI in Geography.

The educational social science family and Geography as a discipline in particular should encourage in-depth research in order to understand the concept Hack mindset and how it is used as a method in teaching. Teachers must be able to know when to use a particular approach in a given lesson after drawing a lesson plan for CEI in Geography. A proposed practical lesson plans on **Environmental Air Pollution** for Lower and Upper Sixth Classes is illustrated on Figure 5.1. The lesson plan illustrate how teachers are Hackers, where each approach is applied and the type of teaching techniques needed for the lesson to be delivered.

Table 5.1: A Redesigned Log Book Following the CBA Hack Mindset Teaching Method (Form 1 to Upper Sixth)

Day / Date	Time	Lesson Essentials	Lesson Methodology			Duration
			Teaching Method	Teaching approach	Teaching Techniques	
		Module: 2 **Lesson Title**: practical work 8: solid waste management **Lesson Justification:** students generate waste in their class due to their quest for material things which they end up throwing unwanted items to their environment. **Lesson Objectives**: it will enable learners to acquire sustainable waste management skills and knowledge so as to reduce the negative effects of poor waste disposal in their environment	HACK MINDSET	Bias to action	1) **Lesson introduction** Following techniques can be used; ❖ Discovery via assignment ❖ Discussion (open discussion) ❖ Socratic (prompting/probing questions)	10mins
				Fail forward	2) **Lesson presentation** Following techniques can be used: ❖ Outdoor (identify, sort and brainstorm) ❖ Simulation, via small focus group. ❖ Document analysis and discussion via brainstorming ❖ Discovery via role play	40mins
					3) **Lesson conclusion** Following techniques can be used to	50mins

			PROJECT BASE METHOD	Start small	determine the outcome of the lesson: ❖ Situational analysis (design a project) ❖ Writing a project either in class or at home as an individual or group work. ❖ Outline the techniques of project Based work	
Attendance: 80 students: Number Present: … Number Absent…..			Assignment: ……			signature:

Source: Author's Adapted Log Book Format. Field Work 2020.

- **Teacher as Hackers**

According to Josh Linkner, (2017), he sees ''Hacking'' as a criminal act using computer software to violate cyber-security defences. In fact, hacking is a tool, an approach which can be used to destroy or rebuild. While hacking can clearly be used for wrong doing, it can also serve as a powerful model of growth and innovation in teaching-learning. Teachers are hackers who have the ability to unlock potential from students and solve the day to day environmental problems students facing during lesson introduction and conclusion.

- **Hack mindset Teaching method**

The word ''Hack mindset'' in education can also be called ''deeper learning'' or ''real time learning''. Hack mindset is an adjective which simply means being able to produce the intended good result. Hack mindset method is therefore define as an effective teaching-learning method which has as objective to guide students using real life situations for the development of their potentials, skills and values by respecting three teaching-learning approaches which are bias to action, fail forward and starts small during classroom situations. Thus, these three (03) potential approaches can enhance learner competent, skills and values in studying CEI in Geography. According to the Education week research centre, (2016), a national study conducted in USA, indicates that 98% of teachers agreed that integrating Hack mindset method in Competency

base education (CBE) in America will lead to improvement in student learning skills as well as performance.

- **Hack Mindset Method Teaching-Learning Approaches**

Hack mindset method of teaching-learning operates under three potential approaches which can enhance learner's ability to acquired competent, skills and values in the process of knowledge acquisition. They include; Bias toward action approach, fail forward approach and start small approach.

1. **Bias toward action approach**

The Bias toward action can be defined as a discovery teaching-learning learner-centred approach of teaching-learning without assistance from the teacher. Learners are to carry out enquires investigations, excursion, fieldwork, group work, homework and assignment on key knowledge. This approach permit learner to build up the previous knowledge on their next lesson. For example, Teachers may ask students to investigate on recent environmental issues or topics in geography without teacher's assistance**.** Advisable to be apply at the **level of lesson introduction** in a classroom.

2. **Fail forward approach**

The Fail forward approach is referred to as a Co-constructivist teaching-learning learner-centred approach which involves the teacher and the learners in a classroom setting and prepares to exercise teaching-learning activities. The new innovation is that integrated activities with guidelines are initiated on pressing environmental issues by the teacher with the use of handed over documents, presentation and interviews. In this approach, the teacher guides his/her students with follow up questions so to aid learners on how to build knowledge from scattered knowledge. This is because of the failure recorded in the first approach which is bias to action. Advisable to be apply at the **level of lesson presentation** in a classroom.

3. **Start small approach**

Start small is a problem solving teaching-learning learner-centred approach but the teacher serves as a director or a guide to ensure that the learner realised a project base on the knowledge acquire in the first two approaches. It is more of practical work in classroom or out of which involves small project writing, a problem model approach in handling pressing environmental issues. This approach can help the local council to transform the student's model in to a community based project. Thus, teaching waste as an environmental pressing issue in Yaoundé VI Municipality, learners are obliged to write small projects to their local councils for sponsor

and implementation for example a letter. Advisable to be apply at the **level of lesson conclusion** in a classroom or out (see Appendix how it can be implemented).

5.3.3: Recommendation for further research

The current study examined the use of Hack mindset method in teaching CEI in Geography, with a case study analyzing geography teacher's perception in Yaounde VI Municipality. However, claiming that this study is complete will be unjust. Further studies could be carried out to fill the gaps. These studies could suggest the application of this new method in teaching other areas in Geography or other social sciences subjects like History, Economics, Philosophy with specific teaching strategies to easily teach and master these subjects. Other work could study on how Hack mindset method can be used in teaching contemporary Developmental issues in Geography.

5.4: Conclusion

This chapter is concerned with revisiting what was done in the previous chapter. We took a look at the purpose of the study, the Theorical frameworks that guided the study. It also looked at the methodology on which this research work is based. We further moved to the presentation of the result based on the analysis. The major finding of the study revealed that about 75.95% of the sample population was ignorant of the Hack mindset teaching-learning method in teaching CEI in Geography and only 24.05% was aware of the method. Another major finding of the study revealed about 30.37% of sample population indicated that limited knowledge on Hack Mindset Method and its approaches is the major difficulty teachers are going to face. It was discovered that more of the ignorant category appear more in the study. This shows that secondary schools Geography teachers in Cameroon use little Hack mindset method because they have not been exposed to Hack mindset method in teaching. The study concludes that a reorganization of CBA in the teaching of CEI using two CBA teaching methods called Hack Mindset and Project based teaching-learning method appear to be an imperative for the development of life-skills in learners to solve environmental problems. We then proceeded by giving the pedagogical implications of this study and recommendations in teaching and for further research.

Figure 5.1: A PROPOSED LESSON PLAN FORMAT USING HACK MINDSET METHOD

AN INDIVIDUAL LESSON PLAN IN GEOGRAPHY FOR LOWER AND UPPER SIXTH CLASSES, THURSDAY 3RD FEBRUARY 2022

NAME OF TEACHER: NGHOLAPEH FRED MUSI

NAME OF SCHOOL: CHAMPIONS SECONDARY AND HIGH SCHOOL OBILI YAOUNDE VI

CLASS / STREAM: LOWER AND UPPER SIXTH CLASSES

SEX: MIXED

AVERAGE AGE: 16 YEARS

ENROLMENT: 45 STUDENTS

DAY /DATE: THURSDAY 3RD FEBRUARY 2022

TIME: 12 PM -1: 40PM

DURATION: 02 PERIODS (50 MINUTES EACH)

MODULE 7: Understanding and managing Contemporary Environmental and Developmental Issues.

FAMILY SITUATION: Globalization

TOPIC: Contemporary Environmental and Developmental Issues

SUB-TOPIC : Environnemental Degradation.

LESSON 1 : Pollution

NOTIONS : Environnemental Degradation. And Pollution.

PREVIOUS KNOWLEDGE:

- Some of the students have come across pictures, recent textbooks and watch engaging video on national and international TV stations which try to document the manifestation of pollution in term of define, sources, types and the specifies of air pollution.

DIDACTIC MATERIALS:

A dirty classroom or school campus, hand gloves, dustbins, guided passage/documents, chalkboard and cardboard(pictures)

LESSON SITUATION IN REAL LIFE:

- After a mini-field trip with your classmate around your school environment within Yaounde VI, you discovered that the situation reflects pollution you once read, hear and watch. What can be your way out to approach such similar environmental problem in the future

Example of situations	Examples of actions	Stages	Essential Knowledge	Attitudes	Aptitudes (skills) Lesson objectives	METHODOLOGY			Progressive Evaluation	Duration
						Teaching Method	Teaching Approaches	Teaching Techniques		
- Globalization -Waste management	Better adaptation to global change processes	**INTRODUCTION**	**1.) <u>Correction Assignment:</u>** -Find out what is pollution? -And identify sources types, causes, consequences and remedy to Pollution using previous knowledge**.** **2) <u>Lesson justification and objectives</u>** -knowledge from this lesson is on pollution will be used to solve real life situations related to problems cause by air pollution. -After this lesson, students will be able to: i) Define pollution and identify types of pollution. ii) Explain causes, consequences and solution of air pollution **3)lesson title lesson announces.**	-Sense of observation -Sense of critique -Sense of Organization	Evaluate -Define -Identify -Classify -Explain	**Hack Mind Set Method**	**Bias to Action Approaches.**	Using a discovery teaching via assignment on lesson. 1: Pollution -Brainstorming via open discussion. -Using Socratic Teaching Technique via probing and prompting questions to verify learner's previous knowledge on Pollution	1. According to your own understanding what is pollution? 2. Why is pollution an environmental issue? 3. What can be done to solve this human induced problem.	**10 Minutes**
		PRESENTATION	**<u>Learning Activities</u>** A. Document Analysis on Pollution as a lesson for the day. B. Guided questions shall be provided by the teacher in the document to help learners understand the lesson through the document. C. Students answer questions provided in the document.	-Sense of observation -Sense of critique -Sense of Organization		**Hack Mind Set Method**	**Fail forward Approach**	Outdoor investigation -Simulation via small focus groups -Analysis of documents via reading and brainstorming, discovery, role play and discussion	i) What is Pollution? ii.) Identify 02 types of Pollution iii) From the document explain the following a) two cause of causes of pollution b) two consequences of pollution c) three remedies of pollution.	**45 Minutes**

			LESSON SUMMARY NOTES: Pollution is one of the serious environmental problem facing mankind and can be defined as the contamination of earth environment physical components through the release of toxic substances into air, water and land which are harmful to man, plants and animals. Base on the sources of pollutants called toxic substances, causes, effects and measures, we can classify pollution under three main types which are; air, water and land pollution. Another is noise or sound pollution. Air pollution on the other hand refers to the release of toxic pollutants or substances into the earth's atmosphere that are harmful to man, animals and plants thus, it become a global environmental issues. Areas highly affected by air pollution are mining areas, major industrial regions and chemicalised agricultural regions. The following are causes of air pollution: dust storms, volcanic eruption, industrial emissions, agric emission, transport emission, mining emission, public and domestic emission, war and explosive emission which have severe negative consequences which demand urgent remedy from man.							
		CONCLUSION	**Lesson conclusion: Lesson outcome** -Situational Analysis and designed a project. -A Choose either classwork by on time allowed (either individual or group work). -Write a sensitization talk or answer short questions on the lesson	-sensitivity in solving environmental problems via project base writing -sense of critique and organization	Evaluate -Define -Identify -Classify -Explain -Analyze -Examine procedure of doing	**Project Base Method**	**Start Small or -Project writing**	-Open discussion via brainstorming. -Role play via documents analysis and sorting vital points needed. -Project writing or respecting principle of answering questions.	-lesson summary: pollution, sources, types, causes, consequences and solutions air pollution - Project Writing G.C.E A/L Essay type questions a) Account for high rate of air pollution observed in the world today (13marks) b) Examine the consequences and measures to mitigate air pollution (12marks)	**45 Minutes**

REFERENCES: REFERENCES:

1.) Geography for competency Development: A Functional approach to Geography study book one by Akwa Constance. N and others (2015) by GREEN WORLD - PUBLISHER (Pages 118-120)

2.) Complete Physical Geography and Contemporary Environmental Issues for advanced Learners, CBA 2RD Edition Nchangvi S.K (2020) by GRASSROOT publishers (Pages 353-358).

3.) Geography Syllabus; SECONDARY GENERAL EDUCATION: 1 & 2 Classes, Inspectorate of Pedagogy in charge of social sciences (2014) by MINESEC.

1.) Learning Activity Lower and Upper Sixth classes: Document analysis

Lesson Justification and Objectives: Knowledge from this lesson on pressing environmental issues will be useful to the learners to solve future real life problems related to the environment. Thus, at the end of the lesson, the following objectives shall be attained:

- To define an environmental problem, raise from the document
- To explain the different forms or types of environmental problem raise from the document.
- To investigate and examine some causes of environmental problem raise from the document
- To explain some consequences of environmental problem, raise from the document
- To propose conservation measures to check environmental problem, raise from the document

Lesson Assumption

- The rate of human activities on space has ushered in new environmental problems in the Biosphere.

DISCOVERED EMVIRONMENTAL ISSUES AS A GLOBAL CHALLENGE.

DOCUMENT ANALYSIS 1:

Issues of global Concern e.g. waste mounds, bad odour, respiratory and heart diseases, dirty water, frequency of water-related diseases. We are expected to analyze, design, propose, sensitize, apply or adopt mitigation and adaptation measures e.g. to these global issues of high concern like proper waste disposal, treat water etc. Some environmentalist thinks the only way out competent acting with so many solutions or measures provided such as i) **Use of alternative clean energy resources and efficient energy devices:** - New cleaner sources of energy such as hydro- electric power, solar energy, wind and geothermal energy are used by most industries today instead of fossil fuels such as coal and natural gas which release pollutants – CO2, carbon monoxide etc.- into the atmosphere during combustion. China, for example, is closing coal-fired power plants. -Moreover, the use of efficient energy devices which consume less energy has also resulted in the reduction of fossil fuel emissions. Gasoline-fueled cars are increasingly being replaced with zero-emissions vehicles such as electric ones. ii) **Global action:** On a larger scale, many international conventions, treaties, conferences and seminars have been organized to fight air pollution. One way is by making commitments to limit emissions of carbon dioxide and other greenhouse gases. The Kigali Amendment seeks to further the progress made by the Montreal Protocol, by banning heat-trapping hydro fluorocarbons (HFCs) in addition to CFCs. iii) **Relocation of Industries:** Most heavy industries have relocated far away from settlements so as to reduce the incidence of air pollution. This is seen in most developed countries where there are special industrial estates far off from cities. iv) **Installation of high chimneys or filters:** Heavy polluting industries have installed high chimneys on their buildings so that the toxic gases can be released far into the atmosphere where they will have no impact on man. Alternatively, filters or absorbers have been installed to reduce

pollutants from waste gases. v) **Anti-pollution laws:** Most states have legislation or laws regulating air pollution and other forms of pollution. For example, the Clean Air Acts were passed in the USA, which required industries to use air filters to reduce atmospheric pollution. Fines are levied to defaulters. In the same vein, controlling the level of noise from loud speakers, cars sirens and horns are done through legislation. vi) **Reduce car emissions** by restricting the number of cars in circulation. This involves allowing odd-numbered cars into cities like in Mexico City on one day and even-numbered cars on another day. Improving public transport can also limit the number of private cars in circulation and cut down on emissions. vii) **Recycling of waste** using improved technology as in developed countries to avoid incineration which further pollutes the atmosphere with COD2. viii) Other measures: -Proper education on waste disposal -Proper monitoring of air pollution -Seeking medical advice and care in case of respiratory and heart disorders or diseases resulting from air pollution. Some group of environmental scientist sees **Pollution** is the contamination of the environment, i.e. air, water or land, by the release of substances in quantities or levels that are harmful to man, plants and animals. The substances that cause pollution in the environment are called pollutants. Pollution is one of the serious environmental problems facing mankind. Recent data from the World Health Organization (WHO) shows that 9 out of 10 people breathe air which is highly contaminated with high levels of pollutants. An estimated 7 million people die each year from environmental pollution. **Types of Environmental Pollution** There are three main types of pollution. These are air, land and water pollution. To these can be added sound or noise pollution (which is sometimes included under air pollution by some authorities). Each type is associated with specific causes and effects which need to be understood for appropriate measures to be adopted. **Air pollution** refers to the release or injection of substances into the atmosphere in quantities or to levels that are harmful to man, animals and plants. It is one form of pollution that is of global concern because pollutants in the air are carried all around the globe. The pollutants comprise a mix of particles and gases that can reach harmful concentrations both outside and indoors. Soot, smoke, mold, pollen, methane, and carbon dioxide are just few examples of common pollutants. Its effects can range from higher disease risks to rising temperatures. In the U.S., one measure of outdoor air pollution is the Air Quality Index, or AQI which rates air conditions across the country based on concentrations of five major pollutants: ground-level ozone, particle pollution (or particulate matter), carbon monoxide, Sulphur dioxide, and nitrogen dioxide. **Major areas commonly affected** include mining areas or centres such as the Niger Delta in Nigeria; major Industrial regions such as the Ruhr Westphalia Region in Germany, the Pittsburg Region in USA, the Coastal Industrial Region in Cameroon; major urban centres such as Los Angeles, Yaounde, Douala and Bamenda. This also embodies over and chemicalised agricultural regions such as Paris Basin in France, the Mid-West of USA. These areas suffer from serious **negative effects air pollution** like i) **Effects on health**: The effects of air pollution are alarming. It is known to create several respiratory and heart diseases along with other threats to the body. Worldwide. Bad outdoor air caused an estimated 4.2 million premature deaths in 2016, about 90 percent of them in low- and middle-income countries, according to the World Health Organization. Indoor smoke is an

ongoing health threat to the 3 billion people who cook and heat their homes by burning biomass, kerosene and coal. Air pollution has been linked to higher rates of cancer, heart disease, stroke, and respiratory diseases such as asthma. Air pollution can also cause short-term problems such as sneezing and coughing, eye irritation, headaches, and dizziness. ii) **Formation of thin layer on leaves,** leading to reduction in transpiration. iii) **Acid rain:** Harmful gases like nitrogen Oxides and sulfur Oxides are released into the atmosphere during the burning of fossil fuels. When it rains, the water droplets combine with these air pollutants, become acidic and then Tall on the ground in the form of acid rain. Acid rain can cause great damage to human, animals, and crops. Acid rain can corrode materials and burn green plants. iv) **It contributes to climate change,** especially global warming. As more greenhouse gases are released to the atmosphere, more heat from the earth's surface is trapped and prevented from escaping to space. This results in an increase in the average temperature of the lower atmosphere. This in turn affects man and the environment negatively- increase in extreme weather events, floods etc. v) **Depletion of the ozone layer:** Ozone exists in the Earth's stratosphere and is responsible for protecting humans from harmful ultraviolet (UV) rays. Some of the pollutants such as chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons cause the destruction of the ozone layer. As the ozone layer thins, more harmful ultraviolet rays get to the earth and can cause skin and eye related problems, reduce the body's immune system and have the capability to affect crops. **Despite the fact that air pollution is** both causes by natural and human factors. Human factors seem to take precedence today. i) **Dust storms** from deserts hauled along by winds such as the harmattan pollute the atmosphere. Apart from the health hazard associated with dust storms after inhaling these. They cause hazy weather and reduce visibility. ii) **Volcanic eruptions** can also cause dangerous air pollution. Volcanic eruptions can spew massive amounts of dust, gases such as Sulphur dioxide into the atmosphere, sometimes causing cooling that lasts for years. In fact, volcanoes used to be the main source of atmospheric Sulphur dioxide; today, people are. Ash and gases spewed into the atmosphere by the eruption of Mount Pinatubo on June 12, 1991. iii) **Forest fires though occasional accidents**, also contribute to air pollution. These release Carbon dioxide, carbon monoxide and soot in air. iv) **Industrial emissions**: Discharge of solid substances like smoke, dust and soot from industrial machines into the air contaminates the atmosphere. Fumes from industrial processes such as CO2, CFCs, Sulphur dioxide (which eventually form sulphuric acid) also contaminate the atmosphere. This also embodies radioactive rays from industrial processes such as electric plants that use radioactive substances. v) **Agricultural emissions**: The use of various chemicals to boost agricultural productivity contributes to air pollution. Spray of liquid and gaseous herbicides, insecticides and pesticides to control weed and pest contaminate the atmosphere. They emit harmful chemicals into the air and can also cause water pollution. Ammonia is a very common byproduct from agriculture-related activities and is one of the most hazardous gases in the atmosphere. vi) **Emissions from the transport sector:** Gases such as Sulphur dioxide, carbon monoxide and carbon dioxide from exhaust pipes of motor vehicles, ocean-going vessels and aero planes pollute the atmosphere. Increase in car ownership and mobility has resulted to an increase in such emissions to the

atmosphere. vii) **Mining operations:** Mining is a process where in minerals below the earths are extracted using large equipment. During the process dust and chemicals are released in the air causing massive air pollution. This is one of the reasons for the deteriorating health conditions of workers and nearby residents. viii) **Municipal and domestic waste or emissions:** Poor refuse disposal results in the emission of bad odour and gases during decomposition to the atmosphere. The incineration or burning of solid waste especially in towns releases much smoke and soot which contaminate the atmosphere. ix) **War and testing of war weapons:** Fumes from explosions of bombs and other dangerous war weapons reduce air quality. **Essential knowledge required to act or competently:** Concept of pollution, types of pollution, air pollution and their causes, effects and controls.

SOURCE: Complete Physical Geography and Contemporary Environmental Issues for advanced Learners, CBA 2RD Edition Nchangvi Sebastian Kangang. (2020) by GRASSROOT publishers (Pages 381-384).

2.) Lesson Situation in Real life:

After reading the documents you must have come across familiar situations you are expose to during a field investigation on major challenges face in waste disposal in your area around the school environment which affect study and daily activities of most people living in that area due to pollution and it needs an urgent remedy. What can you do to avoid this environmental problem in the future?

1. Integrated Activity

Answer the following Guided Questions provided document 1.

A) Learners' Learning Activities:

The teacher is mainly applying the Bias to action and the fail forward approach

Task 1: Identify the main environment pressing problems discuss in the document 1 above. (**03marks)**

Task 2: Trace the extent or origin or degree of the main environment pressing problem discuss in the document 1 above. **(03marks)**

Task 3: For the main environment pressing problem discuss in the documents 1 above.

a) Identify the different forms of the problem and how the operate within the tropical region according to the document **(03marks)**
b) Bring out and explain five causes of the problem posed by the document **(02marks)**
c) Shortlist five consequences of the problem posed by the document **(02marks)**
d) Suggested sustainable solutions of the problem posed by the document and classify your solutions into measures to check and strategies to maintain. **(03marks)**

Task 4: Writing a sensitization project on the prevention of Air pollution **(04marks)**

B) Teacher's Activities:

Mainly to harmonized, clarify and give out summary notes at each task given to students above using Bias to action and the fail forward approach.

Lesson Summary Notes

Task 1: The main theme on contemporary environmental issues is **Pollution and Air Pollution.**

A) The definition of terms

i. What is Pollution?

- Pollution is the contamination of the environment, i.e. air, water or land, by the release of substances in quantities or levels that are harmful to man, plants and animals called pollutants.
- There are three main types of environmental pollution these include; air, land and water pollution.
- To these can be added sound or noise pollution (which is sometimes included under air pollution by some authorities).
- Each type is associated with specific causes and effects which need to be understood for appropriate measures to be adopted.

ii. Trace the extent or origin or sources of pollution

- Pollution is one of the serious environmental problems facing mankind.
- Recent data from the World Health Organization (WHO) shows that 9 out of 10 people breathe air which is highly contaminated with high levels of pollutants especially in the MICs and highly industrialized regions of the world.
- An estimated 7 million people die each year from environmental pollution.
- **Major areas commonly affected** include mining areas or centres such as the Niger Delta in Nigeria; major Industrial regions such as the Ruhr Westphalia Region in Germany, the Pittsburg Region in USA,
- The Coastal Industrial Region in Cameroon; major urban centres such as Los Angeles, Yaounde, Douala and Bamenda.
- This also embodies over chemicalised agricultural regions such as Paris Basin in France, the Mid-West of USA.

iii. What is Air pollution?

- **Air pollution** refers to the release or injection of substances into the atmosphere in quantities or to levels that are harmful to man, animals and plants.

- It is one form of pollution that is of global concern because pollutants in the air are carried all around the globe.
- The pollutants comprise a mix of particles and gases that can reach harmful concentrations both outside and indoors. Soot, smoke, mold, pollen, methane, and carbon dioxide are just few examples of common pollutants.

iv. <u>Causes of Air pollution</u>

<u>Natural or physical of air pollution</u>

- **Dust storms** from deserts hauled or bellowing along by winds such as the harmattan pollute the atmosphere.
- **Volcanic eruptions** can also cause dangerous air pollution by injecting massive amounts of dust, ash, gases such as Sulphur dioxide into the atmosphere, sometimes causing cooling that lasts for years. Ash and gases spewed into the atmosphere by the eruption of Mount Pinatubo on June 12, 1991
- **Forest fires** though occasional accidents, also contribute to air pollution by releasing Carbon dioxide, carbon monoxide and soot in air

<u>Human or anthropogenic factors</u>

- **Industrial emissions**: Discharge of solid substances like smoke, dust and soot from industrial machines into the air contaminates the atmosphere, Fumes from industrial processes such as CO2, CFCs, Sulphur dioxide (which eventually form sulphuric acid) also contaminate the atmosphere.
- **Agricultural emissions:** The use of various chemicals to boost agricultural productivity, spray of liquid and gaseous herbicides, insecticides and pesticides to control weed and pest contaminate the atmosphere. They emit harmful chemicals into the air and can also cause water pollution. like hazardous Ammonia is a very common by-product from agriculture-related activities contribute air pollution in the atmosphere
- **Emissions from the transport sector** such as Sulphur dioxide, carbon monoxide and carbon dioxide gases from exhaust pipes of motor vehicles, ocean-going vessels and aero planes pollute the atmosphere and increase in car ownership and mobility has resulted to an increase in such emissions to the atmosphere.
- **Mining operations or** process where in minerals below the earth are extracted using large equipment releases dust and chemicals in the air causing massive air pollution.
- **Municipal and domestic waste or emissions through p**oor refuse disposal results in the emission of bad odour and gases during decomposition to the atmosphere. The incineration

or burning of solid waste especially in towns releases much smoke and soot which contaminate the atmosphere.

- **War and testing of war weapons produces** fumes from explosions of bombs and other dangerous war weapons reduce air quality in the atmosphere.

v. **<u>Consequences of air Pollution</u>.** Its effects can range from higher disease risks to rising temperatures.

a) **Effects on health** are alarming as it is known to create several respiratory and heart diseases along with other threats to the body Worldwide.

- Bad outdoor air caused an estimated 4.2 million premature deaths in 2016, about 90 percent of them in low and middle-income countries, according to the World Health Organization.
- Indoor smoke is an ongoing health threat to the 3 billion people who cook and heat their homes by burning biomass, kerosene and coal.
- Air pollution has been linked to higher rates of cancer, heart disease, stroke, and respiratory diseases such as asthma.
- Air pollution can also cause short-term problems such as sneezing and coughing, eye irritation, headaches, and dizziness.

b) **Formation of thin layer on leaves,** leading to reduction in transpiration.

c) **Acid rain produce from the combination of** harmful gases like nitrogen Oxides and sulfur Oxides are released into the atmosphere during the burning of fossil fuels with rain droplets become acidic and then Tall on the ground in the form of acid rain. Acid rain can cause great damage to human, animals, and crops as it corrodes materials and burn green plants.

d) **It contributes to climate change,** especially global warming as more greenhouse gases are released to the atmosphere, more heat from the earth's surface is trapped and prevented from escaping to space resulting to an increase in the average temperature of the lower atmosphere as it turns affects man and the environment negatively with increase in extreme weather events, floods etc.

e) **Depletion of the ozone layer which** exists in the Earth's stratosphere and is responsible for protecting humans from harmful ultraviolet (UV) rays since chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons cause the destruction of the ozone layer. As the ozone layer thins, more harmful ultraviolet rays get to the earth and can cause skin and eye related problems, reduce the body's immune system and have the capability to affect crops.

vi. **<u>Measures to Mitigate or Check Air pollution</u>**

a) **Use of alternative clean energy resources and efficient energy devices:**

- New cleaner sources of energy such as hydro- electric power, solar energy, wind and geothermal energy are used by most industries today instead of fossil fuels such as coal and natural gas which release pollutants CO2, carbon monoxide etc. into the atmosphere during combustion. China, for example, is closing coal-fired power plants.
- Moreover, the use of efficient energy devices which consume less energy has also resulted in the reduction of fossil fuel emissions.
- Gasoline-fueled cars are increasingly being replaced with zero-emissions vehicles such as electric ones.

b) **Global action:**

- On a larger scale, many international conventions, treaties, conferences and seminars have been organized to fight air pollution.
- One way is by making commitments to limit emissions of carbon dioxide and other greenhouse gases. Examples are the Paris agreement ratified on November 4, 2016, aimed at cutting down emissions of greenhouse gases and the Montreal protocol of 1987, which has been amended several times, was aimed at cutting down on the emissions of CFCs.
- The Kigali Amendment seeks to further the progress made by the Montreal Protocol, by banning heat-trapping hydro fluorocarbons (HFCs) in addition to CFCs.

c) **Relocation of Industries:** Most heavy industries have relocated far away from settlements so as to reduce the incidence of air pollution and this is seen in most developed countries where there are special industrial estates far off from cities.

d) **Installation of high chimneys or filters by** heavy polluting industries on their buildings so that the toxic gases can be released far into the atmosphere where they will have no impact on man. Alternatively, filters or absorbers have been installed to reduce pollutants from waste gases.

e) **Anti-pollution laws:** Most states have legislation or laws regulating air pollution and other forms of pollution. For example, the Clean Air Acts were passed in the USA, which required industries to use air filters to reduce atmospheric pollution. Fines are levied to defaulters. In the same vein, controlling the level of noise from loud speakers, cars sirens and horns are done through legislation.

f) **Reduce car emissions** by restricting the number of cars in circulation. This involves allowing odd-numbered cars into cities like in Mexico City on one day and even-numbered cars on another day. Improving public transport can also limit the number of private cars in circulation and cut down on emissions.

g) **Recycling of waste** using improved technology as in developed countries to avoid incineration which further pollutes the atmosphere with

h) **Other measures:** - Proper education on waste disposal - Proper monitoring of air pollution - Seeking medical advice and care in case of respiratory and heart disorders or diseases result from air pollution.

B) <u>Lesson conclusion</u>

The teacher emphasis on the realization of a Sample Project Writing using Start small teach-learning approach after lesson summary.

<u>Task 4:</u> The Population of Yaounde VI Experience Low quality air and water cause by pollution: Write short note on Environment pollution to show the degree of the problem and create awareness.

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APPENDIX

APPENDIX 1: RESEARCH QUESTIONNIERS ADDRESSED TO THE TEACHERS OF YAOUNDE VI

This questionnaire has been designed to assist the researcher collect and analyzed relevant data towards a Master II in Didactic of Geography; Faculty of science of education, University of Yaoundé I. The research topic is ***"Teachers' Perceptions On Hack Mindset Teaching-Learning Approaches in the Didactic of CEDI in Geography within Yaoundé VI Municipality"***. This data provided will be solely for academic purposes. Your collaboration will be highly appreciated.

Thanks in advance

NGHOLAPEH FRED MUSI, 16T3488.

I. Demographic Information of Teachers in Yaounde VI Municipality

1. Sex: Male ☐ Female ☐
2. Age group: 21 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 60+ ☐
3. Occupation: Administrator ☐ Teacher ☐

   Others (Specify) _____

4. How long have you being in service or teaching_____

II. Teachers' Knowledge on the Use of Hack Mindset Method in Teaching of CEDI

1. Are you aware of a CBA teaching method Known as Hack Mindset? **Ignorant** **Aware not using** **Aware using** ☐

III. Teachers' knowledge on the Use Hack Mindset Method Approaches in teaching CEDI

A. Bias to action Approach:

2. Are aware of a Bias to action approach? **Ignorant** ☐ **Aware not using** ☐ **Aware using** ☐
3. Do you always give assignments to your students? **Yes** ☐ **No** ☐
4. If yes, do you always guide them on how to do their assignments? **Yes** ☐ **No** ☐

B. Fail Forward Approach:

5. Are you aware of the fail forward approach? **Ignorant** ☐ **Aware not using** ☐ **Aware using** ☐

6. After students have done your assignments, do you always guide them on what they ought to have done: **If yes, how? (Tick one from below)**
   a. By answering the questions for them ☐
   b. By giving them guideline questions ☐
   c. By mere oral explanations of assignments ☐

C. <u>Start Small approach (A project base approach)</u>

7. Are you aware of any problem solving approach in teaching known as start small**?**
   Ignorant ☐ **Aware not using** ☐ **Aware using** ☐
8. Do you always drill your students during CEDI lesson following the above approach?
   Yes ☐ **No** ☐
9. Do you encourage your students to put in practice the knowledge acquired after or during CEDI lessons? **Yes** ☐ **No** ☐
10. **If yes, how do you do it? Is it by; (Tick one from below)**
    a. By encouraging project writing on CEDI ☐
    b. By encouraging creative CEDI activities ☐
    c. By organising clean- up campaigns on CEDI ☐
    d. By organising sensitization talks on CEDI ☐
11. **Others** _____

<u>IV. Teachers' Perceptions on Hack Mindset Approaches and Usage in Teaching CEDI</u>

12. How do you perceive the usage of the hack mindset teaching approaches in Geography in general and CEDI in particular?
13. **Positive perception** ☐ **Negative Perception** ☐

<u>IV. Challenges Teachers may be facing in the usage of Hack Mind Mindset Approaches in Teaching CEDI</u>

14. Do teachers effectively apply this method in teaching following the CBA?
    Yes ☐ **No** ☐
15. **If No, why? consider the following reasons as hindrances for future effective implementation of Hack mindset method**
    a. Lack of resources ☐
    b. Inadequate technology ☐
    c. Overcrowded classes ☐
    d. Poor mastery CBA Teaching methods/techniques ☐
    e. The content (overcrowded or poorly structured) ☐

f. Limited knowledge about CBA Teaching methods ☐

g. Lack of will to apply the method ☐

h. Don't just like the approach ☐

16. Others _____

V: Teachers' Recommendations

17. In your opinion

…….

…...……

……...……..

18. If the method should be used, what can teachers do to effectively implement this method in the teaching-learning of CEDI within schools so as to achieve one of the UN sustainable development goal 15 (SDGS), ensuring environmental protection and biodiversity conservation? ……

……

……

……

……

APPENDIX 2: <u>RESEARCH INTERVIEW GUIDE ADDRESSED TO THE SCHOOL AUTHORITIES OF YAOUNDE VI</u>

This interview guide has been designed to assist the researcher collect and analyzed relevant data towards a Master II in Didactic of Geography; Faculty of science of education, University of Yaoundé I. The research topic is ***"Teachers' Perceptions On Hack Mindset Teaching-Learning Approaches in the Didactic of CEDI in Geography within Yaoundé VI Municipality"***. This data provided will be solely for academic purposes. Your collaboration will be highly appreciated.

Thanks in advance

NGHOLAPEH FRED MUSI, 16T3488.

I. <u>Information from Divisional Delegate of Mfoundi</u>

1. What are number of Government schools in Yaoundé VI Municipality……, and private schools ……...?
2. Are you aware of the new innovative teaching learning approach e.g. Hack mindset approaches which could be used by geography teachers in teaching CEDI in geography?
   Yes ☐ **No** ☐
3. Some Geography teachers consider overcrowded classroom, the absence of ITCs, Wi-Fi, Google search engine, projectors, limited computers and didactics resources in schools as major challenges for the use of these new teaching approaches, if yes?
4. How much resources have your pumped in to teach CEDI in Geography?
   ……
   ……
   ……
5. What local sustainable teaching strategies can you encourage to ensure that geography teachers adopt to overcome the above challenges in teaching CEDI effectively

……
……
……
……

II. Information from School Principals in Yaoundé VI Municipality

A. Students Information

6. What is your estimated total student enrollment ……?

7. Total number of students offering geography ……?

8. The total number of students in the following classes where recent environmental issues surface in the geography syllabus i.) Form 1 …… ii.) Form 5…..... iii.) Upper Sixth Art ……

B. Teachers Information

9. The total number of geography teaching staff in your school ……

10. How many are trained teachers? ……..

11. How many are not trained teachers? ……

C. Resources information

12. How many class rooms is available in your school? ……

13. How many computers are there in your school? ……

14. Does your school have Wi-Fi and Google search engine install in school for students and teachers used Yes……? **or** No ……. **(Tick) and if yes,**

15. Are geography teachers and students using them?
Yes ……. **or** No ……

16. Is there a projector? If yes, How many……

17. If no, how do you encourage geography teachers to teach the CEDI section in geography

…….

……

……

……

……

III. Resources information from the HODs

18. How do you compromise the teaching of CEDI in your department with the case of overcrowded classrooms, absence of didactic resources and other modern devices listed above?

……

……

……

19. Do you motivate your staff of the department handing CEDI to change from an objective teaching approach to a CBA approaches? **If yes**……

20. How will you appreciate the use of Hack mindset teaching approaches in the teaching CEDI in schools despite the difficulties? Is a **Positive or negative innovation Why…**……

……

……

……

……

APPENDIX 3: <u>CEI Lessons, Practical Works and Further Studies</u>

Table 1 appendix 3: CEI Lessons, Practical Works and Further Studies in Geography Form 1 from Harmonized Geography Scheme 2014

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Practical Works in Geography	CEI Further Study in Geography
Form 1	**Module 2:** The Earth in the Universe	**Topic 2:** Let's Preserve Our Environment	**Lesson 6:** The notion of Environment - Meaning - Components - Ecosystem - **2hours**	**Practical work 5:** -Weather Observation Practical **-1hour**	**Further Study 2:** -Problems of rivers and streams in Cameroon **- 1hour**
			Lesson 7: Natural Regions or Bio-climatic Zones of Cameroon **-3hours**	**Practical work 7:** -Degradation of the natural region of the locality or the school - **2hours**	**Further Study 3:** -Atmospheric disturbances in Cameroon **-1hour**
			Lesson 8: -Forms of Degradation of natural regions in Cameroon (Causes, manifestation and solution) - Waste Management **-2hours**	**Practical work 8:** -Solid Waste Management **- 2hours**	
			Lesson 10: Atmospheric Disturbances **-2hours**		
			Lesson 11:		**Further Study 4:**

			Climate Change (Causes, manifestation and consequences) **-2hours**	**Practical Work 10:** -Manifestation of Seismic and Volcanic activities in Cameroon **- 1hour**	- Climate Change and consequences in Cameroon **-1hour**
	Module 3: Let's protect Ourselves from the wrath of nature	**Topic 3:** Protection Against the wrath of nature	**Lesson 13:** Consequences of the instability of the earth's crust; Volcanism and Earthquake (causes, mechanism and consequences) **-2hours**		**Further Study 6:** -What do you do in case of an earthquake and volcanic eruption (mitigation and adaptation measures) **-1hour**
					Further Study 7: -Other Agents of catastrophes such as Crickets, granivorous birds, elephants (manifestation, consequences and solutions) **-1hour**

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014

Table 2 appendix 3: CEI Lessons, Practical Works and Further Studies in Geography Form 2 from Harmonized Geography Scheme 2014

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Practical Works in Geography	CEI Further Study and Guided Works in Geography
Form 2	**Module 4:** Man in his Environment	**Topic 1:** Man in his Environment	**Lesson 1:** A rapid growth of the world's population and implications on environmental natural resources - **2hours**	**Practical work 4:** -Measures of soil conservation in Cameroon **-1hour**	**Further Study 1:** -Deforestation (causes, consequences and solutions) **- 1hour**
					Further Study 2: -Firewood crises (causes, consequences and solutions) - **1hour**
					Guided or Directed work 3: -Water Problems in their Region or quarter **-1hour**
	Module 5: Space Occupation	**Topic 2:** Space Occupation		**Practical work 7:** - Inventory to a visit quarter or village where school is located and identify (Infrastructures found, Activities carried out, list some common environmental problems observe, initiate Human investment exercise) - **2hours**	**Further Study 6:** - Measures of management of urban problems in Cameroon (Types, consequences, practical solutions) - **2hour**

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014/2019.

Table 3 appendix 1: CEI Lessons, Practical Works and Further Studies in Geography Form 3 from Harmonized Geography Scheme 2014

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Practical Works in Geography	CEI Further Study and Guided Works in Geography
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 20:** -Impact of volcanicity on man (volcanic hazards, importance, mitigation and adaptation preventive measures)	**Practical work 4:** Investigating Coastal processes and effects of waves on human features and some measures of coastal protection against waves	**Further study 2:** Impacts of weathering on the environment (on both natural and human environment)
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 24:** Earthquakes or Seismicity (Definition, structure and causes)		**Guided or Directed work 1:** Wittering in Our Locality (Effects of weathering in their Vicinity)
		Topic 2: The structure of the earth,	**Lesson 25:** Impact of Earthquake hazards on man		**Further study 3:** Rain Water action in Tropical Tropic Areas

		building processes and impacts on man	(effects, mitigation and adaptation preventive measures)		-Processes, of rain water erosion (sheet rill, and gully) - Effects of rain erosion on natural and human landscape in the tropical areas
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 32:** Man in the Limestone Areas (Importance, problems and adaptation in limestone regions)		**Further study 4:** Man and Lake environment in Cameroon (Importance, harmful effects, mitigation and adaptation the case of Cameroon)
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 37:** Man and flood plain interactions (importance, problems and solutions of living in flood plains)		**Guided or Directed work 2:** Problems of portable water in our communities and solutions (manifestation of problems, causes, attempted solutions in the locality)
		Topic 2: The structure of the earth, building processes and impacts on man	**Lesson 41:** Impacts of wave action on human development along the coastal environment (importance,		

			coastal hazards and coastal management strategies**)**		
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 45:** Man in the hot desert Environments (Resources, challenges and adaptation in desert environment) **-2hours**		
Form 3	**Module 2:** Understanding processes operating in nature and protection from environmental hazards	**Topic 2:** The structure of the earth, building processes and impacts on man	**Lesson 47:** Man and Glaciers or Geohazards in glaciated areas (importance, challenges, mitigation and adaptation) **-1hour**		
Form 3	**Module 3:** Understanding weather and climate; and adaptation to climatic excesses	**Topic 4:** The earth-Atmosphere system	**Lesson 58:** Global warming (causes, consequences, mitigations and adaptations)		
	Module 3: Understanding weather and	**Topic 4:**	**Lesson 59:** Floods, droughts and desertification		

	climate; and adaptation to climatic excesses	The earth-Atmosphere system	(causes, consequences, mitigations and **adaptation)**		
Form 3	**Module 3:** Understanding weather and climate; and adaptation to climatic excesses	**Topic 4:** The earth-Atmosphere system	**Lesson 60:** Water Scarcity (causes, manifestations, consequences, and water conservation methods)		

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014/2019.

Table 4 appendix 3: CEI Lessons, Practical Works and Further Studies in Geography Form 4 from Harmonized Geography Scheme 2014.

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Further Study and Guided Works in Geography
Form 4	**Module 1:** Understanding Ecological Systems and Preservation of its engrained resources	**Topic 1:** Conserve world's Biomes and resources	**Lesson 4:** Soil erosion (types and causes)	**Further Study 4:** Deforestation in Cameroon (causes, manifestation, consequences and solutions)
	Module 2: Fight against poverty and underdevelopment	**Topic 2:** Managing resources for development through economic activities	**Lesson 5:** Soil conservation (meaning and measures)	

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014/2019

Table 5 appendix 3: CEI Lessons, Practical Works and Further Studies in Geography Form 5 from Harmonized Geography Scheme 2014

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Practical Works in Geography	CEI Further Study and Guided Works in Geography
Form 5	**Module 2:** Preservation of our environment and it natural resources.	**Topic 1:** development and environmental management.	**Lesson 24:** Land reclamation schemes (methods, advantages and disadvantages, future challenges and possible measures)	Practical work 4: Investigating Coastal processes and effects of waves on human features and some measures of coastal protection against waves	**Further study 2:** Impacts of weathering on the environment (on both natural and human environment)
			Lesson 27: Pollution (types, causes, consequences and solutions)		**Guided or Directed work 1:** Managing pollution in our community through inventory (sources and attempted solutions in the locality)

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014/2019.

Table 6 appendix 3: CEI Lessons, Practical Works and Further Studies in Geography for Lower and Upper Sixth from Harmonized Geography Scheme 2019

Classes Involved	Module	Topic	CEI Lessons in Geography	CEI Practical Works in Geography	CEI Further Study and Guided Works in Geography
Lower and upper sixth	**Module 1:** Understanding and managing atmospheric and hydrological phenomena and hazards across the world in general and Cameroon in particular Ecological Systems and Preservation of its engrained resources	**Topic 6:** Climates	**Lesson 27:** Pollution (types, causes, consequences and solutions)	**Practical work 4:** Investigating Coastal processes and effects of waves on human features and some measures of coastal protection against waves	**Further study: 1** Tropical weather disturbances -Thunderstorms (Distribution, causes, and consequences) -Tornadoes (Distribution, causes, and consequences) -Tropical cyclones (Distribution, causes, and consequences)
					Guided or Directed work 3: Water scarcity or floods in your locality (Situations of water shortages or occurrences of floods in the locality)

Lower and upper sixth	**Module 2:** Understanding and managing geomorphological processes hazards across the world in general and Cameroon in particular	**Topic 2:** Crustal processes and their effect on land surface and man	**Lesson 7:** Volcanoes and man (volcanoes as hazards, importance, mitigation and adaptation strategies)		
		Topic 3: Denudational Processes on slopes	**Lesson 8:** Earthquake and Man (nature, distribution, causes, earthquake as hazard, consequences, mitigation and adaptation strategies)		
			Lesson 11: Impact of weathering on environmental landscape and man		
			Lesson 12: Mass wasting or Movement (Impacts on man and environment and solutions)		

Compile by the Author 2020.

Source: Harmonized Geography Scheme 2014/2019

APPENDIX 4: Step 6: Integrated Activity: How PBL method on CEI is used in Guided Work 3: Water scarcity or floods in Lower and Upper Geography Appendix.

a. Project Topic: Observing and recording problems related to water scarcity or floods around Yaounde VI locality.

b. Locate the area of study: This should include the name of the site, sub-division, division and Region. If a GPS is used, include latitudes, longitudes and height. State the vital or prominent physical and human features in the area and a sketch map is necessary as a geography true identity.

c. State the Problem: For example, could be shortage of or excess water at some periods in the community.

d. State the objective: For example, could be to observe time of occurrence of water deficits or shortages or surpluses and their impacts in your community

e. State the possible results or the hypothesis (Outcome): for example, could be changes in natural phenomenon or population increase in the Yaounde VI locality.

f. Resources to carry out the project: Student has to knowledge of extreme weather events, precipitation, drought, river discharge, river regimes, teacher and other resource persons and statistical techniques to analyze and present data.

- Observe your locality continuously for a year and record the following: Situations of water shortages or occurrences of floods
- Record the period or dates on which they occur
- Take pictures to show the situations of the chosen problem
- Identify the causes
- Outline the consequences
- Write down the different solutions provided for these problems now in your locality.
- Are they successful in solving the problems?
- Suggest more efficient methods they can use.
- NB: Illustration with pictures is advised.

g. Writing Project Report:

MINESEC NPls' Guidelines for Presenting Project Reports after field investigation.

a) The project report should be concise and focused on the activities carried out on the field.

b) The report should be structured in O3 major parts: Introduction, body and conclusion.

i. Introduction: It should contain the following elements:

- A description and/or representation of the area in which the study was carried out;
- The aim of the study:
- Identification and description of the problem observed:
- The duration within which the study was carried out;
- A statement on the procedure of work and likely outcome of the study.

ii. Body: It should be structured into 03 subparts:

- Describing the activities carried out in the investigation,
- Analysis phase and
- Interpretation phase.

ii. Conclusion: It is a summary containing the following:

- proposals geared towards solutions
- proposals geared towards suggestions
- Proposals geared towards recommendations and/or resolutions of the problem identified in the study.

c) Consider guidelines on assessment of Project Reports when writing.

- The project report constitutes 25% of the annual assessment marks.
- Marks should be awarded according to the rubrics stated under presentation of report above.

Source: Adopted from NIPs MINESEC (2019).

APPENDIX 5: RESEARCH ATTESTATION 2016-2017

REPUBLIQUE DU CAMEROUN

Paix-Travail-Patrie

UNIVERSITE DE YAOUNDE I

FACULTE DES SCIENCES DE L'EDUCATION

REPUBLIC OF CAMEROON

Peace-Work-Fatherland

UNIVERSITY OF YAOUNDE I

FACULTY OF EDUCATION

N°_____ /17 /UYI/FSE/DID

Yaoundé, le 17 AVR 2017

ATTESTATION DE RECHERCHE

Je soussigné, **Pr. MBALA ZE Barnabé, Doyen de la faculté des sciences de l'éducation,** atteste que l'étudiant (e) NGHOLAPEH Fred MUSI, matricule 16T3488, est inscrit (e) en Master I au département de Didactique des disciplines, année académique 2016-2017.

L'intéressé (e), dans le cadre de ses travaux de recherche, a besoin d'une bonne connaissance du terrain à acquérir auprès des écoles maternelles, primaires, des lycées et collèges et des écoles normales de son choix de la ville de Yaoundé.

En foi de quoi la présente attestation lui est délivrée pour servir et valoir ce que de droit. /-

UNIVERSITE DE YAOUNDE I THE UNIVERSITY OF YAOUNDE I
Le Doyen The Dean
FACULTE DES SCIENCES DE L'EDUCATION THE FACULTY OF EDUCATION

Barnabé MBALA ZE
Professeur

APPENDIX 6: RESEARCH AUTHORISATION 2019

RÉPUBLIQUE DU CAMEROUN
*****
Paix – Travail – Patrie
*****
UNIVERSITÉ DE YAOUNDÉ I
*****
FACULTÉ DES SCIENCES DE L'ÉDUCATION
*****
DÉPARTEMENT DE CURRICULA ET EVALUATION

F S E

REPUBLIC OF CAMEROON
*****
Peace – Work – Fatherland
*****
THE UNIVERSITY OF YAOUNDE I
*****
THE FACULTY OF EDUCATION
*****
DEPARTEMENT OF CURRICULUM AND EVALUATION

Le Doyen
The Dean
N°.....02...../19/UYI/VDSSE

AUTORISATION DE RECHERCHE

Je soussigné, **Professeur CHRISTIANE F. EWANE épse ESSOH**, Doyen de la Faculté des Sciences de l'Éducation de l'Université de Yaoundé I, certifie que l'étudiant **NGHOLAPEH FRED MUSI** , matricule **16T3488,** inscrit en Master II, Département de Didactique des Disciplines, Filière : Didactique de la Géographie Option : Recherche Fondamentale.

L'intéressé doit effectuer des travaux de recherche en vue de l'obtention de son diplôme de Master II. Il travaille sous la direction du **Docteur OJUKU TEJFACK,** Enseignant des Universités. Son sujet porte sur :

« TEACHER'S PERCEPTIONS ON HACK MINDSET APRROACHES IN THE DIDACTICS OF GEOGRAPHY: THE CASE OF SCHOOLS IN YAOUNDE VI; MFOUNDI DIVISION ».

Je vous saurais gré de bien vouloir mettre à sa disposition toutes les informations susceptibles de l'aider.

En foi de quoi, cette Autorisation de recherche lui est délivrée pour servir et valoir ce que de droit.

Fait à Yaoundé, le..... 8 JAN 2019.....

Pour le Doyen et par ordre

Le Vice-Doyen

Prof. Auguste OWONO-KOUMA