

## **Contribution of secondary school geography assessment strategies in mitigating climate change in Uganda**

Mwangu Alex Ronald<sup>1\*</sup>, Kagoda Alice Merab<sup>1</sup>, Mugimu Christopher Byalusaago<sup>1</sup>

<sup>1</sup>School of Education, Makerere University

\*Faculty of Education, Kabale University

### **Abstract**

Climate change is one of the most pressing challenges of the 21<sup>st</sup> century. The changing climate affects all aspects of human livelihoods. Effects of climate change are most felt in developing countries due to low awareness and lack of access to information on climate change. Climate change is a major concern to education policy makers and curriculum developers. Education has a role to play in building individual and social capacities for adapting and mitigating climate change. The purpose of education in Uganda is to eradicate illiteracy and to equip the individual with basic skills and knowledge to exploit the environment for self-development as well as national development, for better health, nutrition and family life, and the capability for continued learning. To mitigate climate change, all elements of the education system namely; objectives, content, teaching methods and assessment strategies must lend themselves to building capacities of the learners. This study reveals that the assessment strategies used by geography teachers largely contribute to acquisition of knowledge and hardly develop skills and values/attitudes for mitigating climate change among learners.

**Key words:** Assessment strategies, geography education, climate change, mitigation, secondary school

## Introduction

Climate change is one of the most pressing challenges of the 21<sup>st</sup> century (Mulugeta and Butera, 2012; Gian, 2015). The changing climate affects all aspects of human livelihoods. The changes in climate have led to changes in amount of rainfall, raising temperatures, rising sea levels and changes in seasons which directly affect the wellbeing of human beings irrespective of location. However, the effects of climate change are most felt in developing countries due to low awareness and lack of access to information on climate change. Africa is among the continents with the least intellectual, institutional and technological capability to address the climate challenge (Bloom, Canning and Chan, 2005). As a result of the changing climate, environment problems have increased tremendously at the local, regional and global levels over the last few decades (Mutisya and Barker, 2011). Such problems include food insecurity, drought, spread of diseases and pests, landslides and its associated ills of displacement and death, to mention but a few. These changes reduces the farming activities in developing countries because majority of the population rely on rain fed agriculture. Strikingly, scientists predict climate change impacts to become more severe in future.

Environment problems related to climate change have become a major concern for the international community, particularly for education markers and curriculum developers (Mutisya and Barker, 2011). Education possess the best opportunity to mitigate climate change challenges through preparing the young people to assume adult roles and promote civic responsibility, embrace a common set of economic, environment and political values and share a common objective/purpose/goal, and language. Education promotes individual development, understanding and productivity that contribute to adult productivity and wellbeing (Levin, 2001). Education equips the young people as change agents with relevant knowledge, skills and values on climate change which is passed on to other members of the communities.

UNESCO (2013) observed that education has a central role to play in building social and individual capacities and attitudes for mitigating climate change and avoid worst case scenarios in the future. It adds that education has a continuous role to play in stimulating and reinforcing understanding of and attentiveness to the realities of climate change. Lastly, education has a task of developing skills, capacities and attitudes for adaptation in the face of the already evident and looming climate change impacts. As a result, Education for Sustainable Development (ESD) was initiated by United Nations with focus on environmental education. Similarly UN declared 2005-2014 as the Decade of Education for Sustainable Development that sought to mobilize the educational resources of the world to help create a more sustainable future. Education is one of the many paths to sustainability mentioned in Agenda 21, the official document of the 1992 Earth Summit. Education contributes a lot to a more sustainable future. Geography as a discipline of study contributes a lot to environmental and sustainability education. Geography is a subject of comment and synthesis. Geography is our daily experiences. Geography is a subject of problem solving, experiential learning, place based pedagogies, metaphorical application, action research, reflection and deep learning. The purpose of education in Uganda is to eradicate illiteracy and to equip the individual with basic skills and knowledge to exploit the environment for self-development as well as national development, for better health, nutrition and family life, and the capability for continued learning. This purpose is further reflected in the objectives of secondary education that seek to enable the individual to apply acquired skills in solving problems of the community, and to develop in him[her] a strong sense of constructive and beneficial belonging to that community. To achieve its functions, all elements of geography education i.e. objectives, content, pedagogical methods and assessment strategies must lend themselves to empowering learners to mitigate climate change.

**Literature review**

Assessment is one of the main elements of an education system (Mugimu and Mugisha, 2017; Jonassen, 2004). Other elements of the curriculum are the educational objectives, content (subject matter) and teaching (pedagogical) methods. While other elements of the curriculum are clearly understood, assessment in education remain puzzling to a big number of the teaching profession. A variety of studies look at assessment as a dimension of measurement of the learners' achievement (Mugisha, 2011; Abbatt, 1992; Amri, Ngatia and Mwakilasa, 1993; Spady, 1994). Agrawal (2004) views assessment as a tool for diagnosing problems in the education system. However Jahanian (2012) observe that educational assessment is used in any educational activity for transferring, motivating and acquiring knowledge and skills. For this matter, assessment in education is a vehicle to learning. Assessment enhances knowledge transfer and acquisition as well as skills building. Assessment is rich in pedagogy and avails a platform for engagement between the teacher and the learner. Some assessment strategies are learner centered. These give the learners the opportunity to participate actively with instant/timely feedback from the teacher and fellow learners. These help develop the 21<sup>st</sup> century skills including teamwork, cooperation and collaboration, communication, creativity, problem solving, innovation among others.

Mugimu and Mugisha (2017) observe that assessment drives the activities that students engage in which underpin their learning. Meyers and Nutty (2009) add that careful design of an assessment strategy can ensure that students engage in learning activities that lead to desired learning outcomes. However, many teachers do not know how to design and implement quality assessment tools that are capable of measuring whether meaningful learning is taking place or not (Jonassen, 2004). Effective assessment strategies in geography would judge the student's achievement against an absolute and predetermined standard. It is supposed to relate the learners' grades with the masterly, competence and behaviours that is expected of such grades. This is clearly emphasized in the O level secondary school geography curriculum. This raises one to question whether the assessment strategies used by geography teachers engage learners in activities that promote learning that will lead to mitigating climate change.

A number of studies have investigated assessment strategies used in formal education. Studies of assessment in geography education are scarce but assessment in geography is significant and no less different in importance in comparison to other subjects. Barwinek (2011) note that assessment of students' work and achievements are the most difficult and the most complicated element of educational process. Weeden & Hopkin (2006) observe that good practice in assessment is an important means of improving students' attainment in geography. They add that assessment is a key concern for geography teachers, and an aspect of practice that presents particular challenges to all teachers in secondary schools. Weeden & Lambert (2007) emphasize that challenges exist in the teaching and learning of geography:

“The language of geography is underpinned by the rules and insights that are contained within the existing guiding principles. In these principles are several big ideas such as interdependence or sustainability, and a larger number of key concepts, such as ‘friction of distance’ or ‘erosion’ and deposition’. Perhaps, it is the principles that provide overarching guidance and coherence for formative assessment. They give a sense of purpose in learning geography” (Weeden and Lambert, 2007:5).

In this regard, geography as a subject provides a lot of opportunities for formative assessment. However, many times the uniqueness of the subject is robbed when the emphasis is on teaching to test and drilling students in order to prepare them for examinations (Chun, 2009). Ugodulunwa & Wakjissa (2015) observe that assessment is very important in decision making in the education system and note that geography performance in Nigeria is poor because of poor assessment among

other reasons. This confirms that assessment has a part to play in transferring and enhancing learning.

Ugodulunwa & Wakjissa (2015) observe that portfolio assessment improves learning and performance in geography. They add that portfolio assessment involves and allows students to present the best pieces of their work over time indicating progress and achievement made and the teachers support through engaging learners until mastery is attained. It assesses multiple dimensions of students' progress at different levels of achievement, enable students to self-reflect and self-evaluate and build their own knowledge. It facilitates cooperative and collaborative learning as teachers and students work together to set and evaluate learning goals (Pinar, 2011; Ugodulunwa & Wakjissa, 2015).

Barwinek (2011) list effective methods of assessment in geography as including student's projects, field classes, portfolio assessment and formative assessment. Barwinek (2011) notes that the method of portfolio has a lot of advantages and a lot of opportunities for assessment and it may be chosen because of; freedom of materials' choice, awareness of freedom in action (learning), the right or even a duty to make choices within a given problem (issue) which encourages more effective actions, originality, self – reliance of the preparation

Another method is peer assessment that involves the assessment of learning among co-learners (Mugimu and Mugisha, 2017). The authors add that peer assessment empowers students to recognize their own learning needs and inform the teacher about the needs. This is critical in preparing students who can play a central role in mitigating climate change. Peer assessment is known to have positive effects on students' satisfaction and learning effectiveness in different disciplines (Wong & Ng, 2005). Peer assessment helps to strengthen the learners' voices and improves communication between the learners and their teachers during the teaching and learning process (Black, Harrison, Lee, Marshall & William, 2005). Peer assessment encourages independence in their learning and to connect them to the assessment of their academic progress (Langan & Wheeler, 2003). The authors further submit that classes where students mark a colleagues' assignment can initiate an ability to self-evaluate and reflect on their own work. This can lead to greater understanding of what is required by teachers for assessment in their respective classes.

Peer assessment lead to interactive lessons with detailed reflection on recently completed assessment and the detailed explanation of answers leads to improved understanding (Langan & Wheeler, 2003). Because peer assessment is an open marking system as each assessor needs to see what is required and how to improve work in front of them, provides an opportunity to learners to see standards set by peers as well as their mistakes. This helps the assessors to gain an ability to stand back from their own work and assess objectively. This also helps the learners to improve their understanding of assessment procedures (Langan & Wheeler, 2003). Objectivity of learners is very critical in managing climate change. When learners are engaged in peer assessment the teacher becomes free and observe and reflect on what is happening to frame helpful interventions that could lead to the implementation of remedial provisions to support especially struggling learners in terms of their learning outcomes (Black, et al, 2005; Mugimu & Mugisha, 2017).

Robinson & Udall (2006) have urged that feedback in assessment is useful more so if it is regular and timely and closely related to the outcomes of learning outcomes. In Peer assessment, feedback is given when the course of instruction is still on which gives learners an opportunity to appreciate their own learning gaps and their teachers to adjust their teaching to meet the identified individual needs (Looney, 2008; Mugimu & Mugisha, 2017).

Langan & Wheeler (2003) observe that peer assessment is quicker, more comprehensive learning process and reduces the pressure to mark assessment on the side of teachers. However some studies

observe that some teachers are reluctant to introduce peer assessment due to concerns about the validity and reliability of peer assessment, leading to the problems of inaccuracy/low precision of naïve markers and variability of marking standards of groups of peer assessors (Swanson et al, 1999; Langan & Wheeler, 2003). Nonetheless, there is considerable evidence that suggest that students can peer assess affectively (Langan & Wheeler, 2003; Topping, 1998; Hughes, 2001).

Various scholars have advocated for the use of self-assessment that involves learners measuring their own performance and making important decisions regarding future progress (Abatt, 1992; Black, 1999; Black & William, 1998). Self – assessment is important in the learning process because it enhances student’s ability to develop their own work making it possible for them to manage and control it for themselves (Black et al, 2005). This promotes the learners’ ownership of their learning and more so their learning outcomes may improve through their engagement in self-assessment activities (Mugimu & Mugisha, 2017). Indeed, Robinson & Udell (2006); Frankland (2007) have observed that self-assessment may lead to deeper learning as learners have the opportunity to reflect and judge their quality of work based on clear criteria and standards set by themselves with guidance of their teachers. This reflection attribute is important to producing students/ learners who can assess their actions in environment management and devising appropriate mitigation strategies for climate change. Mugimu & Mugisha (2017) observe that self-assessment is an important tool for improvement of individual learners.

Despite the advantages of portfolio assessment, self-assessment, performance and project assignments, teachers prefer not to use them on account that the curriculum is overloaded and they lack time to use the methods (Pinar, 2011). The author adds that the teachers claimed that for portfolio assessment, students lack opportunities to access internet and other technological means; and on the part of self-assessment that students give insincere answers.

Lumadi (2013) observes that assessment methods, tools and techniques used depend on the curriculum model being implemented. Other studies (Gatullo, 2000; Chen, 2003; Edelenbos & Kubanek-German, 2004; Hsu, (2005) observe that teachers’ beliefs, demographics, class size, teacher training and teacher experience in actual classroom teaching influence teachers’ assessment practices. Mollers’ 2005 study of “Evaluation, Assessment and Geographical Education” in Danish schools revealed that Danish geography teachers accepted the necessity of assessment in order to raise quality of education but they admitted not knowing how to do it. This hindered developing the student’s geographical competences or geographical literacy.

### **Context of the study**

Climate change is a reality in Uganda and it is affecting all aspects of socio-economic development. Uganda is getting more vulnerable to climate change effects. Further, Uganda ranks 15<sup>th</sup> on vulnerability and 147<sup>th</sup> on readiness implying that it is very vulnerable to, yet very unready to combat climate change impacts. Uganda is experiencing the signs and effects of climate change as manifested by rainfall patterns that are low and poorly distributed, prolonged drought, emergency of diseases like Malaria in areas that were previously mosquito free, loss of soil fertility emanating from heavy over run, frequent floods, higher temperatures which provide fertile impetus for pests and diseases (GoU, 2013). Climate change is to blame for loss of human life and animals; and food insecurity. Uganda’s *Vision 2040* concedes that “one of the challenges to the country’s development is the weak management of environment and climate change” (GoU, 2013 p.5). Education lies at the center of reducing vulnerability and at the same time increasing readiness because any effective intervention needs individuals and societies that are aware of the various aspects of climate change.

### **Statement of the Problem**

The National Development Plan NDP II (2015/2016- 2019/2020) pronounces that climate change is not only a challenge to the population but also one of the greatest challenges impeding growth and the country's transition from a low income country to a mid-income country. *Uganda Vision, 2040* states that there is still poor understanding of climate change and climate variability and hence inadequate adaptation and mitigation measures currently in place (GoU, 2013). Education is among the effective pathways for resilience, adaptation and mitigation of climate change. Geography as an interdisciplinary subject possesses the best opportunity to deliver content about climate change. Geography as a subject that teaches human-environment relationship is supposed to address the serious society problem by equipping the learners with the relevant knowledge and developing their skills to avoid and address bad practices that cause and promote climate change. This involves all the components of the education system (objectives, content, teaching methods and assessment strategies) working together to achieve the general objectives of the education system. However, the contribution of assessment strategies used by geography teachers in mitigating climate change have not been explored.

### **Purpose of the study**

The purpose of the study was to examine the contribution of secondary school geography assessment strategies in mitigating climate change in Uganda.

### **Objectives of the study**

The study set out to;

- i. Investigate the assessment strategies used by secondary school geography teachers in Uganda.
- ii. Determine whether the assessment strategies used by secondary school geography teachers enhance climate change mitigation in Uganda.

### **Methodology**

This study used a descriptive survey because it was deemed most appropriate in identification of people's opinions about a phenomenon (Mugenda and Mugenda, 2003). Questionnaires and interviews were used to collect data. Eighty seven Secondary school geography teachers (71 answered questionnaire and 16 interviews) participated in the study. The participants were drawn from private, community and public secondary schools in four districts of Karamoja (North Eastern region), Bududa (Eastern region), Kayunga (Central region) and Kasese (Western region). The selected district have experienced extreme climate change events including unprecedented flooding, drought, landslides and the disastrous effects namely death of animals, crop failure, food insecurity and hunger, loss of human life among others. Simple random sampling and purposive sampling was used to select respondents in the study.

### **Findings**

Results from data collected indicate that tests are the most popular assessment method used by geography teachers (85%), followed by examinations (77%), classroom exercise (31%), assignments (7%), debating (3%) and practical/Map work and photographic interpretation (4%). In most schools, there exists a policy of regular tests and examinations e.g. weekly tests, mid-month tests, end of month tests, beginning of term exams, mid-term exams, end of term exams, internal exams and external exams set by geography teachers' associations i.e. Wakiso Senior Secondary Head-teachers Association (WAKISSHA). Teachers issue tests to assess specific areas of interest.

Schools opt for external examinations from external subject associations, and schools that are considered to be of higher standard with an aim of comparing the level of progress of their students in relation to students in other schools at a specific milestone especially in candidate classes i.e. before registration and mock examination.

External examinations are marked centrally by members of the teachers' associations. This puts the teachers on spot to ensure that they cover the curriculum as recommended by the curriculum designers' schedule. This sometimes leads to teachers adopting teacher centered methods like the talk and chalk method so that students cover all the topics at the various milestones as recommended by the curriculum formulators. This implies that in one way the assessment strategies influence the teaching methods for a teacher to use.

Debates were lowly rated. A respondent observed that *"debates were used to test a variety of attributes of teaching and the learning process namely knowledge, skills and attitudes/values as well as testing the undirected learning experience especially arising from current affairs"*. Another respondent disclosed that debating was an *"effective assessment strategies because it promotes attainment of knowledge, development of skills like communication skills, critical thinking skills, teamwork, self-explanation, confidence building, problem solving skills development, creativity and shared responsibility"*. These attributes are critical in combating climate change challenges and consequences.

A respondent explained that practical/Map work and photographic interpretation as an assessment method promoted development of interpretation, analytical, presentation, social, statistical analysis and problem solving skills as students strived to understand the processes as well as the general information and solutions and responding to abrupt queries.

Majority of the respondents 60(84.5%) urged that the assessment strategies largely tested knowledge and facts and therefore promoted acquisition of knowledge for mitigating climate change. A teacher stated that;

*"The nature of questions set show that the aim of the geography examiners is to test knowledge and facts and the standard duration of sitting an examination paper allows for such shallow questions that tests knowledge and facts"*.

This implies that there is no coordination in work of curriculum examiners, curriculum designers and the aims and objectives of O level geography education.

Some teachers 11 (15.5%) said that the assessment strategies does not promote the acquisition of knowledge for mitigating climate change because climate change does not appear in the O level curriculum; therefore climate change is not taught to O level students and therefore not assessed. They explained that they teach topics which they expect to be examined. This implies that teachers only teach what they expect to appear in the examinations. It also implies that examinations supersede the general objectives of geography education and education for that matter. It also implies that education is looked at in a narrow perspective of merely passing exams instead of being a vehicle of creating change and society reengineering.

Majority of respondents 56 (78.9%) said that the assessment strategies does not promote the development of skills. Respondents urged that assessment strategies don't promote critical skills for mitigating climate change and other social problems namely; negotiation skills, critical thinking skills, communication skills, team work and disaster risk reduction skills among students. Geography as a discipline at O level is largely assessed theoretically. Some respondents stated that skills can only be tested through practical examinations. The teachers confessed having challenges of setting questions that examine skills because the students would have to attempt the questions theoretically and this would not make any meaning.

This implies that teachers pay less attention to the aspects of skills development of students and in the end they don't make any attempt to assess it. This therefore implies that there is a mismatch between the assessment strategies, the O level geography education objectives and the general objective of education in Uganda. It also implies that students are getting half of the prescribed value they are supposed to get at the end of the O level.

Some respondents noted that the assessment strategies used for example the section on map work and photographic interpretation test a variety of skills that enable students in identifying the occurrence, effects and consequences of climate change.

Majority of the respondents 57 (80.3%) stated that the assessment strategies used by geography teachers do not promote the development of values and attitudes for mitigating climate change or any other social problem. A respondent observed:

*“Secondary schools are mainly concerned with transmitting knowledge; they don't have a vocational element of developing skills. It is hard task to identify benchmarks for assessing whether the students have attained the values and attitudes you want them to have and the assessment methods we use cannot develop attitudes and values on anything ...”*

The assessment strategies promotes values of interest in the environment, appreciation of beauty of the environment, respect for the environment and care for the environment. However given the lowly rating of the mentioned values, it is implied that the assessment strategies' contribution to development of values to mitigating climate change is minimal.

Results revealed that best assessment practices for geography that test and enhance application, practicability and mastery of knowledge, proficiency of skills and processes are hardly used. Such methods like peer assessment, portfolio assessment and self-assessment develop the 21<sup>st</sup> century skills namely communication (understanding and communicating ideas), collaboration (working with others), creativity and innovation (producing high quality work) and critical thinking (solving problems) which are needed in mitigating climate change are seldom used.

## **Discussion**

The findings show that teachers use tests (85%), examinations (77%), classroom exercises (31%), homework assignments (7%), debates (3%) and practical (4%). It is clear that the teachers' assessment strategies are focused on preparing students for examination as the widely used methods are in the format of the final examinations. This finding is in agreement with Lumadi (2011) observation that assessment methods, tools and techniques used depend on the curriculum model being implemented. This finding also clearly brings out the teachers' practices of drilling students with the aim of memorization, recalling and relaying of facts in examinations. Some schools issued a test or examination paper from various top schools in each week in the third term of senior four. This finding relates to Gatullo (2000); Chen (2003); Edelenbos & Kubanek-German(2004); Hsu (2005) observation that teachers' beliefs, demographics, class size, teacher training and teacher experience in actual classroom teaching influence teachers' assessment practices. The geography teachers' beliefs in Uganda are that students should be able to pass final examinations and they mostly use assessment methods similar to examinations format.

Although the teachers claimed their action was meant to wipe out anxiety of examinations from the students so that at examination time, they are familiar with the process which allows concentration and therefore performing better; it is evident that this whole practice is meant to encourage rote learning, mastery and memorization of facts. This is contrary to Kochar (1984) postulation that evaluation involves all kinds of means to ascertain the quality, value or effectiveness of the desired

outcomes. Quality, value and effectiveness of the desired outcomes of O level geography education is not a focus of the used assessment strategies.

The assessment strategies used in O level geography education are inconsistent with the objectives of the subject. To ascertain quality, value and effectiveness would require following various procedures and processes and this would be at various levels and stages. This is in contrast to Lumadi's (2013) finding that teachers in South Africa carried out assessment as per the prescribed assessment policy. Geography being an interdisciplinary subject to be evaluated successfully requires a clearly laid down procedure against which conclusion can be made as the National Protocol on Assessment (NPA) Grades R-12 (DoE, 2011) of Republic of South Africa advocate. In this case, formative assessment is the ideal criterion to ascertain quality, value and effectiveness.

Formative assessment methods i.e. peer assessment; self-assessment and portfolio assessment that not only determine achievement but also enhance learning are not used. The assessment methods used don't lend themselves to constructivism because students' are not given activities that push them to think critically in order to solve the problems, they are not given opportunity to be practical so that their experiences are judged and the feedback helps them to improve, perfect or to clear the misconceptions. Such activities would also motivate the learners to think of new ways of solving the problems at the same time ensuring lifelong learning. This is contrary to Jahanian (2012) postulation that education assessment is used in any educational activity for transferring, motivating and acquiring learning. Instead summative assessment which enhances the memorization of facts is used.

For O level geography education to be useful in mitigating climate change, it should evaluate how learners are developing skills and how their values about various issues like climate change are changing. However the assessment strategies used do not tread this path. The methods used don't give learners tasks and challenges to actively generate and enhance their knowledge, make judgment, reflect on personal decisions, question occurrences, communicate, be creative and critical thinkers and to solve problems. The assessment methods used in the current study don't engage the learners in the assessment and instead they are passive recipients of the outcome. Such methods deny the learners learning opportunities. In this regard, the O level geography seem not be creating a critical mass of activists and change agents to spearhead mitigating climate change. The assessment methods used by geography teachers don't teach learners to learn.

This study finds that assessment methods used require learners to "explain", "what", "briefly write about" factors, causes, effects, consequences, describe, *etc.* This is a manifestation that the assessors were not interested in developing the students' skills of analysis, interpreting and application of skills. The assessment strategies don't lend themselves to developing the students' application of knowledge to solve abstract and practical problems such as climate change thus running contrary to Kochar (1984). The assessment strategies used in O level geography teaching determines what is taught and how it is taught in the classroom. This is in congruent with Agrawal (2004). However, Jahanian (2012) supposition that in conducting an education assessment, an education procedure is compared with its predetermined goals to find its fulfillment is contrary to the findings of the current study. The predetermined goals of O level geography education are to facilitate acquisition of knowledge, development of skills and values; as well as practical applicability to sustainably use their environment. But the examinations and tests lack activities that investigate the mastery of skills and development of values and attitudes in environment management. This is partly because the teachers just like the learners are precisely aware of how their efforts will be judged and evaluated. This is in agreement with the findings of Cadlin and Edelhoff (1982). Therefore, it is implausible that any teacher would deem the mastery of skills seriously when in the end it won't be evaluated.

Assessment using student debates and practical are rarely used yet they would promote and determine the extent to which education procedures are in line with the students' capabilities, the practicability of educational procedures and the level of success in achieving educational objectives and goals. This is in contrast with Kochar (1984) who asserted that establishing conformity of educational procedures to student's capabilities and success of educational objectives as the substance of assessment in geography. It can therefore be said that the assessment strategies used is half baked, weak and defective as it asks for less of what geography education is meant to offer. In the end, students' coverage of the curriculum is also affected as teachers narrow the scope of coverage and thereby denying the students an opportunity to learn about issues the curriculum designers deemed to be important. It is therefore observed that there is a mismatch between the curriculum objectives and the assessment strategies used.

The study finds that the assessment strategies does not enhance the development of skills on mitigating climate change. It was the contention of 78.9% of the respondents that geography teachers and UNEB examination setters don't focus on measuring the attainment and proficiency of skills. This is regardless of the fact that development and mastery of skills is explicitly emphasized by NCDC (2008) in the curriculum objectives. The assessment of O level geography focus on measuring facts and knowledge. Attitudes and values are not assessed. It is therefore manifested that methods used evaluate the lower cognitive level of learning. This is congruent with Agrawal (2004) observation that the nature of testing has a restricting effect on curriculum and teaching methods. According to Agrawal (2004), assessment such as the using of multiple choice tests encourages the teacher to teach students test-taking skills. Geography needs assessment that develops the meta-cognitive skills and understanding of climate change issues and its threshold concepts like adaptation, resilience, mitigation and general climate science which have been dubbed complicated.

Pencil and paper method of evaluating students testing for knowledge is used. Observation of students' changes in behavior, individual capabilities of learners that are critical in managing climate change and the general welfare of the environment are in no way assessed. This is contrary to Seif (2008) and Melby (1958) observation that the main goal of education is to make changes in learners' behaviors and not only acquisition of knowledge and skills; and therefore education assessment should not only be interested in knowing what students know but also what students are and becoming and how their behavior is changing. This raises concern that the assessment strategies of O level geography is certifying people who know but cannot do or cannot act in mitigating climate change and the general environment just as Melby (1958) noted.

### **Conclusion**

In this study, assessment strategies are the determining factor of what is taught and how it is taught. The teachers and learners are majorly concerned with passing exams. Pencil and paper examinations are the popular methods used for assessment. These test knowledge and facts and are best for ranking of students and progression to higher studies. The questions are shallow and do not encourage reflective thinking, creativity and problem solving skills. Skills and values are not assessed. Assessment in education is for transferring, motivating learning but the popular methods of the geography teachers in the current study don't lend themselves to fathom these attributes. The popular assessment methods in this study don't engage learners in activities that can develop their knowledge, skills and values in environment and climate change management. Portfolio assessment, peer assessment and self-assessment are very effective in teaching geography but they are rarely used.

If geography education is to contribute to climate change awareness and mitigation of O level students, formative assessment methods namely portfolio assessment, peer assessment and self-assessment that develop and measure the development of the 21<sup>st</sup> century skills namely collaboration, communication, creativity, critical thinking skills and attainment of values are appropriate and should be regularly used. Formative evaluation examines and develops knowledge, skills and values as well as the level of achievement of certain levels of competences would be ideal. Formative assessment would give feedback to students and at the same time guide teachers on the decisions to take in the classroom including content selection, selection of methods and teaching aids among others. The popular assessment strategies in the current study do not measure what students can do with the knowledge acquired after the learning experience yet this is the essence of geography education at O level. The popular assessment methods used do not ascertain whether the students can solve the society's problem, whether they can apply the knowledge in the community, whether they have attained the skills, whether they can preserve and protect their environment and whether they can lead to innovations that will ensure sustainable use of the natural resources in their communities and globally.

Overall, assessment is not aligned to the curriculum objectives. Although curriculum theorists postulate that objectives are the starting point that determines the content, teaching methods and assessment strategies, the assessment strategies used in O Level geography education repeats those theories as assessment is the starting point and the end. The assessment methods used by secondary school geography teachers lack the intrinsic value of fostering learning for mitigating climate change. In this case the teachers don't exploit the opportunities that harness practical learning and mastery of skills. In reality, the assessment strategies are detached from the objectives of the O level geography education. Therefore, it cannot be denied that assessment strategies used by geography teachers and the examining body UNEB promotes knowledge acquisition on climate change. However, the assessment strategies are deeply flawed and neither do they develop the skills nor values that are crucial in mitigating climate change. The assessment strategies are apparently more important for determining what is taught than developing the predetermined competences of the instruction.

### **Recommendations**

Arising from the findings of this study, the following recommendations are offered:

1. The Uganda National Examinations Board should review the assessment strategies and align it to curriculum objectives so that O level geography education plays its part of empowering children to fulfill their civic responsibilities to their nation by assessing the acquisition, development and application of knowledge and skills as well as attitudes/ values.
2. Teacher training institutions should choose assessment strategies that teach teachers to learn and to teach
3. Teachers should choose assessment strategies that teaches learners to learn.

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