

Action Research on the Use of Audio Visual Aids to Develop Positive Attitudes towards  
Geography in First Form Students at the Christ Church Foundation School



In Partial Fulfillment of the Diploma in Education (Secondary)

## Introduction

Learning occurs as an individual develops new knowledge, skills or attitudes through their interactions with information and the environment (Heinich et al, 2002). According to Adeyanju (1997) this brings about a relatively permanent change in behavior.

Educators are generally concerned with providing instruction which allows the individual to develop new knowledge, skills or attitudes. The goal of the educator therefore is to arrange information and the environment to facilitate learning in the classroom.

Educators perceive the use of learning aids as an integral part in the learning process (Adeyanju, 2003). These instructional materials enhance the learning experience for students by stimulating learners' interest, motivating students to participate in class activities, developing positive attitudes towards learning and arresting the learners' attention (Heinich et al, 2002; Adeyanju, 2003 and Kochkar, 1984). It is important therefore for an instructor to adopt the use of teaching aids within the classroom.

Researchers proposed that there is a positive correlation between the use of learning aids and student performance in classroom assessments.

One of the major instructional materials which are utilized by instructors is textbooks.

“Although textbooks are considered only one of the many instructional resources, the fact remains that many teachers are generally dependent on them...Generally speaking, text books play a more prominent role in high school instruction (Education in the United States of America, 1951, p. 51 in Kochkar, 1984). In the Barbadian classroom there is also a strong reliance on the use of textbooks as an instructional material. Since 1975 government has provided a textbook loan scheme for students in all public secondary

schools. Through this scheme textbooks are sourced and loaned to students in all subject areas taught within the school.

Unfortunately, the social studies students in the first and second year at the Christ Church Foundation School are currently unable to reap the benefits of using a textbook in this discipline since there is none available. This has posed problems for teachers since there is a need to utilize other instructional materials. However, the main methods utilized by teachers are lecturing, dictating notes or writing notes on the chalkboard or furnishing students with handouts. According to Oyesola in *Criteria for Selecting Audio-Visual Materials in Geography Teaching in Post-Primary Institutions*, “modern geography is concept centered and the nature of the discipline calls for more sophisticated teaching methods”. Oyesola advocates the use of audio-visual aids in the teaching of geography arguing for innovation in the teaching geography through effective use of audio-visual aids. Kochhar (1984) also believes in the use of audio-visual aids to make the teaching of social studies realistic and vivid. Kochhar (1984) posits the view that simple chalking and talking will not be effective. In a review of the literature on student views and correlates regarding social studies Perricelli (2008) points out that such instructional method fails to motivate students. Thus, students’ attitude towards social studies is generally negative. It is the need for a more effective use of audio-visual aids and the lack of instructional materials (namely textbooks) in the teaching of geography to the first and second form students which has guided the researcher towards conducting research on the use of audio-visual aids to enhance the teaching of geography. This action research serves to improve the attitudes of students’ towards social studies through the adoption of audio visual aids to motivate students.

1. What effect does the use of audio visual aids have on the attitudes of students in 1 alpha 2 in the classroom environment?
2. Which audio-visual aids do students find most motivating during geography instruction?

#### Literature Review

According to Heinich at al (2002) since the turn of the century, teachers have utilized a number of audio visual aids in classroom instruction. These are seen as integral to the learning environment. In the teaching of social studies and geography there is a great need for the use of these instructional materials in the classroom. Students are asked to understand the physical and social environment both in the past and present. These environments may be in close proximity to the learner or maybe in a different part of the world. Kochhar (1984) argues that it is this aim of social studies that makes the use of audio visual aids imperative. Kochhar (1984) believes that with the use of audio visual aids the following benefits are derived:

- 1) make social studies real, vivid, vital, interesting and life-like
- 2) helps students to develop concepts more readily
- 3) students' attitudes are improve and there is an extension of students' appreciations and interests
- 4) help to increase the retention of information

Instructors generally agree that these benefits are garnered from the use of audio visual aids. In a study on the teachers' perception of the effects and use of learning aids in teaching Adeyanju (2003) concludes that over ninety percent of the eighty

teachers in the case study believe that the use of audio visual materials has a positive effect on teaching and learning.

There is a variety of audio visual aids which are at the disposal of the teacher particularly with the explosion of technology in modern society. Audio visual aids may be categorized into five categories display boards (chalkboard, flannel board, collage and mural three dimensional materials; (models, mobiles, sand tables, dioramas and salt maps) graphic materials; (maps, globes, diagrams, charts and graphs) electronic aids; (radio, television, tape recorder, overhead projector, smart board, slides and the Internet) and real objects and specimen.

Dale (1969) contended that abstract instructional activities are at the pinnacle of learning. In his Cone of Experience, there is a move from the concrete to the abstract.

It is argued that the instructor does not need to put in as much effort, time and financial resources when using abstract audio visual materials. Thus, greater importance is placed on moving students from the concrete instructional activities towards the use of verbal and visual symbols. Bruner, a psychologist proposes a similar view, while symbolic or abstract materials are at the pinnacle of audio visual material there is a need to move from the concrete to the abstract. When a learning task is presented to a learner who has no prior knowledge is it important that the instructor begins with the concrete and moves towards the abstract (Heinich et al, 2002).

Research suggests that the concrete materials and experiences best promote learning and remembering. It is proposed that eighty percent of learning and remembering results from the use of concrete materials. It is believed that audio visual aids which

the students are actively engaged in constructing are more effective than those which the students simple view. The work of Dewey and Gandhi both support the use of having students actively engaged in the learning process arguing against the use of “bookish knowledge” (Kochhar, 1984).

While a review of the literature to this point has been concentrated on the use of audio visual aids to promote learning and remembering it is also important to determine how these instructional materials can be used to motivate students.

There is a plethora of research concerning students’ views on school and particular subject areas. The attention of this literature review will now be turned towards the attitudes held by students toward social studies and ways that student motivation can be improved.

According to Perricelli’s (2008) review of the literature on student views and correlates regarding social studies social studies is considered to be the least favorite subject and is generally seen by students as unimportant. Perricelli (2008) refers to the work of Shaughnessy and Haladyna (1985) as evidence of students possessing negative attitudes towards social studies. Shaughnessy and Haladyna (1985) sampled students in grades four, seven and nine.

Perricelli (2008) states that McTeer (1976) points out one of the causes of the negative attitudes students have towards social studies relates to the instructional methods which teachers utilize. The argument is for a greater emphasis on student-centered, rather than teacher centered classrooms. Selecting McTeer (1976) selected 391 subjects to participate in a research study examining the relationship between the teaching methods utilized by teachers of social studies and the attitudes held by

students towards social studies. One of the conclusions made by McTeer was that students liked the use of films and filmstrips (one type of audio-visual aid) in the teaching of social studies.

More recent research on improving student motivation by examination of instructional methods has been conducted by Perricelli (2008). 69 fourth grade students participated in the research. Students were taught five lessons utilizing the following instructional methods: lecture, cooperative learning, simulation/role play, hands-on project and audio/visual simulation. Results of the research study showed that audio/visual simulation was the most successful of the five methods. Perricelli (2008) notes that interviews with the students revealed they perceived the lesson utilizing audio/visual material as fun, engaging and the subject matter interesting and informative. The least favored method was the lecture method (a traditional method of teaching). Downing (1997) and Moore (2003) notes that the traditional methods of teaching treat children as passive learners thus failing to motivate students.

A review of the literature shows the value of using audio visual aids in the classroom. While the literature is conclusive about the benefits of audio visual aids in the classroom it must be noted that the literature on the use of audio visual aids stems from research in countries outside of the Caribbean and the Barbadian context. This action research not only serves to examine the use of audio visual aids in motivating the students of 1 alpha 2 but to add to the body of knowledge on the use of these instructional materials in the Barbadian society.



## Methodology

### *Research and Design*

The purpose of this study was to find out if students would develop positive attitudes towards geography by utilizing audio visual aids in the classroom as well as to identify the audio visual aids which students preferred. In order to gather data this study used a questionnaire (Refer to Appendix A) adapted from Perricelli's (2008) research study on Social Studies and Motivating Factors: Views of Fourth Year Grade Elementary Students. This questionnaire included the following statements:

1. I would pay more attention in social studies if my teacher taught like this all of the time
2. After the lessons, I am beginning to like social studies more.
3. After the lesson I am afraid to ask questions in social studies class.
4. After this lesson, I think that it is important to learn about social studies
5. After this lesson, I am interested in learning more about what I studied today.

Changes were made to these questions to determine the extent to which students developed positive attitudes towards geography (Refer to Appendix A). A Likhert scale was used to determine the extent to which students agreed with each statement.

1=Strongly Agree    2=Agree    3=Neutral    4=Disagree    5=Strongly Disagree

Section two of the questionnaire was used to identify the audio visual aids which students considered to be effective. Students were asked to identify the top three most effective activities used during the duration of teaching practice.



*Participants*

32 students from form 1 alpha 2 comprised the group under investigation for the action research. Student composition is as follows: 16 females and 16 males. 1 student was absent and could not complete the questionnaire.

*Materials*

A unit plan and lesson plans were created to provide ten consecutive weeks of instruction with the use of audio visual aids. These plans incorporated the following audio visual aids:

1. Real Objects and Specimen: rock collection (refer to Appendix F), layered cake, limestone rocks, sedimentation of soil shown in measuring cylinder
2. Printed/Reading Material: activity booklet on types of rocks (refer to Appendix G), Website <http://www.rocksforkids.com/RFK/howrocks.html>, photocopies of page 22 from Barbados Our Environment
3. Graphic Material: diagrams of cross-sections of Barbados showing physical region(refer to Appendix H) , map of physical region of Barbados, political map of Barbados, student created diagrams of formation of Barbados (refer to Appendix J)
4. Audio Aids: Rock Cycle Song, Formation of Barbados Song (refer to Appendix M)
5. Three Dimensional Material: model of volcano (refer to Appendix N) and salt dough model of Barbados
6. Electronic Aids: transparencies of physical region map and political map of Barbados (refer to Appendix L), Smart board activity for set induction using

image of Harrison's Cave (refer to Exhibit A, Folder Name: Smartboard and Power point Presentation created for First Form, File Name: Harrison Cave Set Induction), Slideshow on Types of Rocks (refer to Exhibit A, Folder Name: Smartboard and Power point Presentation created for First Form, File Name: Solid As A Rock), Smart board activity for labeling physical regions and parishes in Barbados (refer to Appendix K).

**INSTRUCTIONAL PLAN**

DURATION: 10 WEEKS  
OF PERIODS: 20 PERIODS

NO.

FORM: 1 ALPHA 2  
RANGE: 11-12 YEARS

AGE

SUBJECT: SOCIAL STUDIES  
ORIGIN AND STRUCTURE OF BARBADOS

TOPIC:

RATIONALE: Students are naturally interested in their environment and how things are created or formed. In examining the origin and structure of Barbados students will be able to explore their environment and gain an understanding of how this environment was formed or created. This will lead students towards developing a sense of pride for their country and an appreciation for its unique topography. In addition, students will become aware of the environmental concerns which are related to the origin and structure of Barbados.

COMMENTS: Students have mixed abilities.  
Two students within the class repeated this year level.

TOPICS/CONCEPTS	GENERAL OBJECTIVES	TEACHING METHODS	LEARNING ACTIVITIES	TECHNOLOGY/MATERIALS	ASSESSMENT	FOLLOW-UP ACTIVITIES
Types of Rocks	Know the different types of rocks and how they are formed	Lecture	Viewing a presentation on the different types of rocks	Multimedia Projector Laptop	Worksheets which test students' ability to classify different types of rocks	Write an essay on formation of a type of rock.
Formation of Barbados	Understand how Barbados was formed	Cooperative Group	Working together to identify different types of rocks	Handouts on Types of Rocks	Diagrams of stages of formation of Barbados	
Structure of Barbados	Apply knowledge of formation of Barbados to determine the structure of Barbados	Guided Discovery	Examining a series of images to determine the stages of formation of Barbados	Images of stages of formation of Barbados		
		Experiment	Testing rocks in Barbados to determine types of rocks found in Barbados	Vinegar Beaker Limestone Sandstone Worksheets	Worksheets which give the results of the experiment	
		Experiment	Designing an experiment to determine	Layered Cake Straw Worksheets Cross-sectional maps of Barbados	Worksheets which test students' ability to label layers of rocks on a cross section of	
Physical Regions of Barbados				Worksheets Blank Maps		Write a report on the field trip

	Know the physical regions of Barbados	Field Trip  Cloze Procedure  Cooperative Group	<p>How cross-sections are made and the purpose of using cross-sectional maps</p> <p>Observing and describing the changes in the landscape of Barbados</p> <p>Completing sentences on the physical regions in Barbados</p> <p>Working together to produce a model of the physical regions of Barbados</p>	<p>of Physical Regions of Barbados</p> <p>Worksheets</p> <p>Blank maps of physical regions Atlas Salt dough Cardboard Tempera paint Paint brush Marker</p>	<p>Barbados</p> <p>Completed blank maps of physical regions of Barbados</p> <p>Fill in the blank exercise</p> <p>Completed models of Barbados showing physical regions</p>	
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## Lessons Plans

**DATE:** 2010-01-15**TIME:** 1:20-2:40**DURATION:** 80 mins**FORM:** 1 ALPHA 2**AGE RANGE:** 11-12 years**SUBJECT:** Geography**TOPIC:** Types of Rocks**GENERALIZATIONS:**

The classification of rocks into sedimentary, igneous and metamorphic is based on the way in which a rock is formed.

**CONCEPTS:** sedimentary rock, igneous rock, metamorphosis**OBJECTIVES:**

1. Describe the formation of sedimentary, igneous and metamorphic rocks.
2. List two examples of each class of rock.
3. Sing a song which describes the rock cycle.
4. Conduct experiments to determine the characteristics of sandstone and pumice.
5. Interpret the results of an experiment on the sedimentation of soil.
6. Follow rules established for working in learning centers.

**TEACHING STRATEGIES/METHODS:**

Individualized Instruction

Independent Study

Experiment

**TECHNOLOGY/MATERIALS:**

Measuring cylinder

Bowl of water

Soil

Sandstone

Limestone

Conglomerate

Pumice

Rock Collection

Landforms: An Introduction to Geomorphology by Ian Galbraith and Patrick Wiegand

Physical and Environmental Geography by Keith Grimwade

Handouts on Types of Rocks

Internet Websites (<http://www.youtube.com/watch?v=v3yJARifULo> and<http://www.rocksforkids.com/RFK/howrocks.html>)

Teaching Assistant

**SET INDUCTION:**

Inform students of the rules for working in the learning centers.

**LEARNING ACTIVITIES/EXPERIENCES:**

Ask students to spend a maximum of fifteen minutes in the reading station, activity station and the computer station to complete the tasks described below.

#### Reading Station

Ask students to use the reading materials (handouts and books) to describe how sedimentary, igneous and metamorphic rock is formed.

Ask students to list two examples of each class of rock.

#### Activity Station

Ask students to feel the sandstone rock and describe the characteristics of sandstone.

Ask students to observe what happens when pumice rock is placed in water and describe the characteristics of pumice rock.

Ask students to interpret the results of an experiment on the sedimentation of soil.

#### Computer Station

Ask students to watch videos on the rock cycle.

Ask students to use the following websites to describe how sedimentary, igneous and metamorphic rocks are formed.

Ask students to use the following websites to list two examples of each class of rock.

#### Free Choice Station

Ask students to look at the rocks in the rock collection.

Ask students to complete crossword puzzles.

#### **ASSESSMENT PROCEDURES:**

Students will complete written tests which will be collected and graded.

#### **CLOSURE:**

Students will sing the rock cycle song.

Test papers will be collected.

#### **FOLLOW-UP ACTIVITY:**

#### **EVALUATION:**

This class started late. Students were told that they were to attend a seminar which was later cancelled. Thus, the room was not organized into the centers. Students were used to help set up the materials in each center. Students were taught the rock cycle song and sang this while they were setting up the centers.

Students enjoyed working in the activity and the computer station. However, the reading station did not seem popular. Students in this center had to be constantly reminded of the need to keep on task. This is because students wanted to participate in the other centers which seemed to be more fun. While questioning students in this station, it was discovered that they were not doing the reading properly. A few students who finished all stations early had to be sent back to the reading station. It is important that students understand that reading is a part of the learning process and is necessary to gain information.

Monitoring of the students was a bit problematic since the teaching assistant was unavailable based on the miscommunication about the seminar. This activity required two teachers to assist students particularly in the activity station where students had lots of questions about what they were observing and the reading station where students were not remaining on task.



In future, the use of learning centers will only be adopted once there are adequate resource persons who can assist in monitoring student activities such that they get the most of the centers.

Despite the challenges, the learning center seemed a good way for students to become actively involved in their own learning. Additionally, it allowed me the opportunity to offer those students who needed assistance individual attention. It also allowed me to cater to the multiple intelligences which exist within the class. This is one activity which can be used again.

The assessment procedure was changed. The instructions given at each learning center were used to determine whether students were able to meet the objectives. Students were asked to report on their achievements of the tasks assigned within the learning center. In addition, there oral questioning was used with the entire class to determine whether the objectives of the class were met.

The written test will be taken in the following lesson.

**SIGNATURE OF INSTRUCTOR:**

**DATE:** 2010-01-22

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Types of Rocks

**GENERALIZATIONS:**

The classification of rocks into sedimentary, igneous and metamorphic is based on the way in which a rock is formed.

**CONCEPTS:** sedimentary rock, igneous rock, metamorphosis

**OBJECTIVES:**

1. Describe the formation of sedimentary, igneous and metamorphic rocks.
2. Classify six rocks (limestone, pumice, sandstone, basalt, quartz and marble) into sedimentary, igneous and metamorphic rocks.
3. Describe the appearance of pumice.
4. Devise an experiment which leads to the identification of pumice.
5. Explain why layers are formed in the sedimentation of soil.
6. Sing a song which describes the rock cycle.

**TEACHING STRATEGIES/METHODS:**

Independent Study  
Educational Game

**TECHNOLOGY/MATERIALS:**

Question Sheets  
Test Papers  
Fake “Money”  
Laptop  
Multimedia Projector

**SET INDUCTION:**

Inform students of the activities which will be conducted in class.  
Ask students to sing the “Rock Cycle” song.

**LEARNING ACTIVITIES/EXPERIENCES:**

Ask students to assemble in pairs.  
Inform students that they will be given “Geography Money”.  
Inform students that they will be playing against their partner to answer questions on rocks.  
Inform students that in order to win the game they must answer the most questions which will be indicated by the money gained during the game. When an individual does not answer a question he or she must give one bill to the other person.  
Ask students to sing the rock cycle song to transition to the next activity.  
Ask students to volunteer to play a guessing game which is aimed at identifying rocks.  
Ask volunteer to face the class while a rock is written on the board.  
Inform the student he or she must not look at what the rock written on the board.  
Ask student to determine the rock written on the board by asking questions about the formation of the rock and its appearance.

Inform students that they can ask a maximum of three questions and are allowed two responses.

Inform students that they can use a life line which allows them to see a picture of the rock or the rock itself.

Continue the guessing game with students until the six rocks have been identified.

Ask students to sing the rock cycle song to transition to the independent activity.

#### **ASSESSMENT PROCEDURES:**

Students will complete written tests which are based on the objectives. These will be collected and graded.

#### **CLOSURE:**

Ask students to evaluate the lesson.

Test papers will be collected.

#### **FOLLOW-UP ACTIVITY:**

#### **EVALUATION:**

This class was shortened to forty-five minutes. Thus, the initiating activity, the guessing game and the transitional activity (singing the “Rock Cycle” song) did not materialize. Students were simply given the rules for the quiz-like educational game. This only affected the achievement of objective six.

The quiz-like educational game was able to motivate the students. Students were motivated by the “Geography Money” which was lost only when a student answered a question incorrectly. Students became quite competitive and even though the students were noisy and had to be reminded of the need to do the activity quietly much of the noise was centered on the game.

The students also reported in their evaluation that the game was not only enjoyable but was able to help them revise the material taught in class. Students admitted that they had not revised for the test and found revision at home to be boring. However, they saw the game as a fun way to do revision.

Of the thirty one students who did the test six children failed to reach the pass mark. The objectives which these students were unable to meet would have been objective one and two. Students who also scored in the middle range of the test also lost marks on the section which tested their knowledge of how rocks are formed. Students will be asked to complete a homework assignment on rocks to ensure that they understand how rocks are formed and can give examples of each class of rock.

Most students showed competence in explaining the sedimentation process and devising an experiment to test for a pumice rock. This revealed that the method of experimentation used to teach these areas was quite effective. However, as anticipated students did not spend quality time in the reading center since it was perceived as less fun than the others. Students must see reading as an important medium in the learning process.

#### **SIGNATURE OF INSTRUCTOR:**

**DATE:** 2010-02-05

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Types of Rocks

**GENERALIZATIONS:**

Barbados contains three strata of rock (Scotland Series, Oceanic Series and a Coral Cap).

Barbados is composed of sedimentary rock.

**CONCEPTS:** stratification, sedimentary rock

**OBJECTIVES:**

1. Define the term stratification.
2. Identify the three strata of rock (Scotland Series, Oceanic Series and Coral Cap) in the formation of Barbados.
3. Describe the formation of Barbados.
4. Perform a fictitious news report to describe the five stages in the formation of Barbados.
5. Create a diagram showing the formation of Barbados.

**TEACHING STRATEGIES/METHODS:**

Demonstration

Cooperative Learning: Jigsaw I

Dramatization

Guided Discovery

**TECHNOLOGY/MATERIALS:**

Multimedia Projector

Laptop

Handout on “Formation of Barbados” taken from Barbados: Our Environment

Large Beaker

3 small beakers

Rice

Peas

Markers

Glue

Crayons

Construction Paper

**SET INDUCTION:**

Ask students to watch the tourism advertisement on Barbados.

Ask students to identify the geographical features of Barbados which are attractive to tourists.

Ask students why Barbados has white, sandy beaches while volcanic islands do not.

Inform students of the topic for the lesson.

**LEARNING ACTIVITIES/EXPERIENCES:**

Ask a volunteer to pour the small beaker of rice, then the beaker that contains split peas and finally the beaker that contains field peas into the large beaker.

Question students on the demonstration activity to bring out the definition of ‘stratification’.  
 Ask students to determine a definition for the term ‘stratification’.  
 Ask students to give examples of social stratification using the school.  
 Inform students that the process of stratification is important to the formation of Barbados.  
 Distribute the handouts to students.  
 Ask students to read the formation of Barbados from the handout.  
 Ask students to describe each stage of Barbados’ formation based on the diagrams in the handout.  
 Ask students to perform the rhythm poetry on the formation of Barbados.  
 Show students the beaker with the strata of rice and peas and ask students to use the beaker to identify the layers of rock in Barbados.  
 Distribute the materials for students to create the diagrams.  
 Tell students that they will become experts on one stage of Barbados’ formation.  
 Assign each group with a stage of Barbados’ formation.  
 Ask each group to create a diagram showing the stage assigned and create a fictitious news report which describes the formation of the stage.  
 Ask students to present the diagram and perform the news report.

#### **ASSESSMENT PROCEDURES:**

The diagrams which students produce will be collected and marked.  
 The news report will be used to determine students’ understanding of the formation of Barbados.

#### **CLOSURE:**

Ask students to perform the rhythm poetry.

#### **FOLLOW-UP ACTIVITY:**

Ask students to find definitions of the following words:  
 Folding  
 Faulting

#### **EVALUATION:**

Class time was shortened to forty minutes to accommodate the sporting activities. As such objectives four and five had to be omitted from the lesson. These will be used in the following lesson. The set induction was also modified in the interest of time. Students were simply asked to identify geographical features of the island that attracted tourists. Students were then asked to explain why Barbados had white, sandy beaches. It was felt that the use of the video could be omitted in order to save time for setting up and taking down the equipment.

Students did not respond well to the rhythm poetry. Efforts were made to motivate students to participate, however all students did not perform the rhythm poetry. Some were more enthusiastic than others and these students were the ones who performed the poem. Perhaps, students’ inhibitions caused a fear of participation or students may have seen this activity as one below their developmental level.

The student’s were able to understand the concepts quite well. Student examples on social stratification revealed that they understood this concept. Here, the use of the demonstration worked quite well. It is important to use visuals which help students to understand the material. Another demonstration on folding and faulting was also included though not in the lesson plan since it was felt that students should have an idea of how the rocks were able to

push above the surface of the water. A ruler was used to show how pressure creates folding and faulting.

**DATE:** 2010-02-12

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Formation of Barbados

**GENERALIZATIONS:**

Barbados contains three strata of rock (Scotland Series, Oceanic Series and a Coral Cap).

Barbados is composed of sedimentary rock.

**CONCEPTS:** stratification, sedimentary rock

**OBJECTIVES:**

1. Describe the formation of Barbados.
2. Perform a fictitious news report to describe a stage in the formation of Barbados.
3. Create a diagram showing a stage in the formation of Barbados.
4. Encourage group members to share their ideas to produce a diagram and fictitious news report.
5. Evaluate the performance of group members when given the task of encouraging group members.

**TEACHING STRATEGIES/METHODS:**

Cooperative Learning: Jigsaw I

Dramatization

**TECHNOLOGY/MATERIALS:**

Rice

Peas

Markers

Glue

Crayons

Construction Papers

Diagrams of Stages of Barbados' Formation

**SET INDUCTION:**

Review the previous lesson by asking students to arrange the stages of Barbados' formation in the correct sequence.

Inform students of the instructions for the cooperative learning activity.

**LEARNING ACTIVITIES/EXPERIENCES:**

Inform students that they will be working in groups today.

Distribute the cooperative group rubric to students.

Ask students to discuss some of the problems they encounter when they work in groups.

Inform students that one of the objectives of the group will be to encourage group members.

Ask students to brainstorm ways in which they can encourage group members.

Ask students to read the formation of Barbados from the handout.

Distribute the materials for students to create the diagrams.

Tell students that they will become experts on one stage of Barbados' formation.

Assign each group with a stage of Barbados' formation.



Ask each group to create a diagram showing the stage assigned and create a fictitious news report which describes the formation of the stage.

Monitor students as they work in groups.

Ask students to present the diagram and perform the news report.

**ASSESSMENT PROCEDURES:**

The diagrams which students produce will be collected and marked.

The news report will be used to determine students' understanding of the formation of Barbados.

A rubric on encouragement in cooperative groups will be used.

**CLOSURE:**

Ask students to evaluate the cooperative group activity.

**FOLLOW-UP ACTIVITY:**

Ask students to review the formation of Barbados.

**EVALUATION:**

Students were not able to complete the diagrams and perform the news reports during this lesson. Students will complete their group work assignments in the next class. In assessing the diagrams of the students which students created it was determined that the lesson would need to be re-taught with greater emphasis placed on what is expected with regards to the diagrams. Student diagrams were not clear and did not show that they understood how diagrams in Geography should be constructed. Students concentrated on using the materials to make their diagrams attractive. However, the diagrams were unable to reflect the stages in the formation of Barbados.

Much of the lesson had to be focused on helping students to understand how they could encourage their group members and the importance of being able to work with others. Students demonstrated during the brainstorming activity that they knew ways to encourage members in a group using words. However, they needed to be guided towards how they could use body language and gestures to encourage. Monitoring the students revealed that they were encouraging group members; even though some of the encouragement was given mainly when they were being observed and seemed excessive since they wanted to receive a good mark for the group work. Further practice would allow students to genuinely encourage others when engaged in group activities.

While this lesson ended up being affective and helping students to develop social skills the diagrams and news reports which would have assessed students' knowledge of the topic being taught were not finished. It seems as though trying to include activities which are student centered such as the news report and diagrams require a lot of time to complete. In general, I am discovering that getting the students more involved in the learning process requires a lengthier period to teach what is on the syllabus. The time allotted for this unit of work will be surpassed since activities such as the one used in this lesson appear to take up time. It seems difficult to find a balance between being driven by a syllabus and being driven by the needs of the learners.

**DATE:** 2010-02-19

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Types of Rocks

**GENERALIZATIONS:**

Limestone reacts with acid to produce carbon dioxide.

When limestone reacts with acid it is dissolved.

A large proportion of Barbados seems to be made of limestone.

**CONCEPTS:**

Weathering, dissolution

**OBJECTIVES:**

1. Investigate the reaction of acid on limestone rocks.
2. Interpret the results of the limestone test on rocks taken from different areas in Barbados.
3. Draw a diagram to show the results of the limestone experiment.
4. Explain how weathering of limestone produces caves.
5. Predict what could happen to Barbados if there is an increase in acid rain.
6. Cooperate with group members to carry out an experiment on limestone rocks.

**TEACHING STRATEGIES/METHODS:**

Experiment

Guided Discovery

Discussion

**TECHNOLOGY/MATERIALS:**

Vinegar

Rocks

Plastic Cups

Calcium Carbonate

Hydrochloric Acid

Bicarbonate Indicator

Test Tubes

Delivery Tube

Cork Stoppers

Smart Board

Laptop

Multimedia Projector

Teaching Assistant

**SET INDUCTION:**

Inform students that they will be playing a guessing game in order to reveal a picture of Harrison's Cave in Barbados using the Smart Board. Provide students with clues and ask students to guess what lies behind the tiles on the Smart Board. When the picture has been

revealed ask students to indicate the type of rock found in Harrison's Cave. Ask students to determine how the cave was formed. Inform students of the objectives of the lesson.

### **LEARNING ACTIVITIES/EXPERIENCES:**

Group students into four sets.

Inform students that calcium carbonate is the chemical found in limestone.

Tell students that the experiment they will be carrying out is used to test for the presence of calcium carbonate or limestone.

Ask students to read aloud the instructions for the limestone test.

Distribute the materials/apparatus for the limestone test.

Ask students to work in groups of four to carry out the calcium carbonate test.

Monitor students as they work in groups to carry out the limestone test.

Ask students to share their observations.

Question students on explanations of the experiment.

Provide feedback on student's explanations.

Ask students to pour vinegar into the plastic cups.

Ask students to add the rocks to the container and observe the reaction which occurs.

Ask students to explain the results of the experiment.

Provide feedback on the student's explanations.

Tell students that pollution can cause the production of acid rain.

Ask students to predict what could happen to Barbados if there is an increase in acid rain.

Ask a volunteer to draw a diagram of the first experiment on the smart board.

Ask students to comment on the diagram.

Show students how to annotate a diagram.

Ask students to complete the laboratory worksheet.

### **ASSESSMENT PROCEDURES:**

Students will complete a laboratory worksheet which will be collected and graded.

### **CLOSURE:**

Ask three volunteers to summarize the salient points of the lesson.

Collect the worksheets.

Ask a volunteer from each group to return the materials to the laboratory.

### **FOLLOW-UP ACTIVITY:**

### **EVALUATION:**

This lesson went quite well. Students were engaged from the start of the lesson until the end. Students were able to come up with all of the generalizations quite easily and accomplished all the objectives within the time allocated.

Students appeared to enjoy the method of experimentation. While this method requires a greater deal of preparation and is more time-consuming than others comments from the students suggested that they would like this method to be used more often in classes.

The use of the Smart Board technology for the set induction and for demonstrating how to annotate a diagram worked quite well. The set induction in particular was able to capture the students' attention. It also helped students to meet objectives four and five quite easily.

Students enjoyed interacting with the Smart Board. More opportunities need to be created for students to use the Smart Board and for a greater proportion of the class to interact with the Smart Board in the lesson.

This lesson could have been improved if one of the laboratories was used instead of the conference room. This would have allowed students to have more space to carry out the experiment and would have offered better monitoring of the students. While classroom management was not a major concern during this lesson the use of the laboratory would have been more ideal. In addition, materials would have been on hand for the students which would have cut down on the set up time and the laboratory assistant would have been there as a resource person to assist students.

In terms of the assessment which was used, students need to understand the importance of producing neat and clear diagrams. Most diagrams were accurate and well-annotated. However, some of the students did not work towards making the diagrams neat. This needs to be reinforced since this is a skill which students need in Geography and Science.

**DATE:** 2010-02-26

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Structure of Barbados

**GENERALIZATIONS:**

While an aerial view shows the surface of an area a cross sectional view can show what lies below the surface of that area.

**CONCEPTS:** aerial view, cross sectional view

**OBJECTIVES:**

1. Design an experiment to identify the rocks which lay below the surface of an area.
2. Cooperate with group members when given the task of designing an experiment to identify the rocks which lay below the surface of an area.
3. Explain the difference between a cross sectional view and an aerial view.
4. Describe the structure of an area of Barbados based on a South to East cross section of the island.
5. Label the strata of rock found in a South to East cross section of Barbados (coral cap, oceanic series rock and Scotland series rock)
6. Draw a diagram of a South to East cross section of Barbados.

**TEACHING STRATEGIES/METHODS:**

Experiment

Cooperative Learning: Numbered Heads Together

Guided Discovery

**TECHNOLOGY/MATERIALS:**

Straws

2 layered cakes

Barbados Our Environment (photocopies of page 22)

Diagram of South to East Cross Section of Barbados

Political Map of Barbados

Markers

**SET INDUCTION:**

Divide students into their work groups.

Ask students to assign numbers to each person in the group.

Distribute materials to each group of students.

Review the previous lesson by asking students to identify the three strata of rock found in Barbados.

Tell students that they will learn how geologists are able to identify the rocks found below the surface and how they are able to display their findings.

**LEARNING ACTIVITIES/EXPERIENCES:**

Tell students that they are geologists and one of the tasks geologists perform is to find out the materials (rocks) which lie below the surface of the earth.

Tell students their job as a geologist is to design an experiment to find out what lies below the surface of "Cakey Isle".

Inform groups that the cake represents the “Cakey Isle”.

Indicate the need for students to write the method which they use to determine the strata of rocks which lie below the surface of “Cakey Isle”.

Tell students they should work together as a team to design the experiment.

Monitor students as they work in groups to ensure they remain on task.

Select a group and a number. Ask student selected to report on the experiment which they designed.

Provide feedback on the experiment designs.

Ask students what they believe is done in real life to determine the materials below the surface of an area.

Tell students as geologists they must show the structure of the island including what lies below the surface.

Ask students to identify different views that can be taken of the island.

Ask students to identify a view which allows them to show the different strata of rock which they found during the coring experiment.

Introduce the terms aerial view and cross sectional view.

Ask students how a cross sectional view is obtained.

Ask students to explain the difference between a cross sectional view and an aerial view.

Tell students that they will be looking at a South to East cross section of Barbados.

Ask students to use the political map of Barbados to draw a line from Christ Church to St. Joseph.

Inform students that the South to East cross section they will be shown is a cross section of this area.

Show students the South to East cross section.

Ask students to describe the structure of this area of Barbados. (Make students aware of the removal of the coral cap on the East of the island).

Ask students to use the handouts taken from Barbados Our Environment to draw their own diagrams of the South to East cross section.

#### **ASSESSMENT PROCEDURES:**

Students will submit the worksheet with the method used in designing the experiment as well as the results and a labeled cross sectional diagram for grading. A rubric has been attached to the lesson for grading of the worksheet.

#### **CLOSURE:**

Ask one student from each group to share what they learnt during the lesson.

#### **FOLLOW-UP ACTIVITY:**

#### **EVALUATION:**

Experimentation is proving to be a great instructional method where students are able to construct their own knowledge. The students were enthusiastic about carrying out the experiment. Students were quite well in the groups to ensure that the experiment was done. One of the benefits of using the experiment is that the students were able to utilize higher order thinking skills. Very often at this level students are taught facts students to regurgitate. It was heartening to see the children being able to meet the first objective of this lesson with very little assistance. For me, it was particularly interesting to see the constructivist approach work so well within the classroom. I am continuing to see children enjoying the lessons more and using higher order thinking skills when they are allowed to be active in the classroom.

Students became restless with the drawing of the cross-section of Barbados and were unable to complete this task. While students were asked to complete this for homework on reflection this activity could have been omitted in the lesson and more emphasis placed on coring and relating this to the experiment which students did. This would also have allowed students to see what geologists do in real life. Perhaps, pictures of geologists coring could have been utilized.

The transition to the cross-section of Barbados could have been smoother so students related the experiment to the diagram that was being shown. Here, asking students about what the cake looked like before it was sliced and relating that to how an island looks from an aerial view as opposed to a cross sectional view could have been used.

The use of pictures for the coring and of aerial views of Barbados would also have allowed the use of technology into the classroom.

However, overall the idea for the lesson was a good one.



**DATE:** 2010-03-19

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Structure of Barbados

**GENERALIZATIONS:**

- A cross sectional view can be used to show the structure of an area.
- The erosion of the coral cap in the Scotland District region makes it vulnerable to landslides.

**CONCEPTS:** cross sectional view, erosion, landslide

**OBJECTIVES:**

1. Describe the structure of an area of Barbados based on a South to East cross section of the island.
2. Label the Scotland District on a South to East cross section of Barbados.
3. Label the Scotland District on a map of Barbados.
4. Predict what could happen to the Scotland District region if there was a hurricane or storm.
5. Justify predictions made when asked to determine what could happen to the Scotland District region if there was a hurricane or storm.
6. Dramatize the effect of landslide on the inhabitants in the Scotland District area.

**TEACHING STRATEGIES/METHODS:**

Cooperative Group: Learning Together  
Guided Discovery  
Role play/Simulation

**TECHNOLOGY/MATERIALS:**

Chart showing South to East Cross Section  
Map of Barbados  
Laptop  
Multimedia Projector

**SET INDUCTION:**

Ask students to sit in their cooperative groups.  
Display a model of a volcano and a cross section of a volcano.  
Ask students to determine the difference between the model and the cross section.  
Review the definition of a cross-sectional view.

**LEARNING ACTIVITIES/EXPERIENCES:**

Display the South to East cross section Barbados.  
Give students the names of the physical regions found in the South to East cross section.

Ask students to identify the layers of rocks found below the surface of Barbados.  
Ask a volunteer to point to an area on the cross section which is not covered by the coral cap.  
Inform students that this section of Barbados is called the Scotland District.  
Ask students to label this section on their cross sectional diagrams.

Ask students to label this section on a map of Barbados.

Ask students to describe the structure of the Scotland District.

Ask students to determine possible reasons why this section of Barbados is not covered by the coral cap.

Ask students to identify the rocks which are found in the Scotland Series and the Oceanic Series.

Ask students to explain what happens when they carried out an experiment on sandstone from a previous lesson.

Inform students that the rocks which are found in the Scotland District can be worn away more easily than limestone.

Ask students to predict what could happen in the Scotland District during a storm or hurricane.

Ask students to dramatize what could happen in the Scotland District area during a storm or hurricane.

Ask students to justify their predictions and the dramatizations.

### **ASSESSMENT PROCEDURES:**

Students will produce diagrams which show the location of the physical regions and layers of rock found in a South to East cross section of Barbados.

Students will produce oral reports where a volunteer from each group will be asked to share their predictions of what could happen in the Scotland District area during a storm or hurricane.

Students will be asked to justify their predictions.

Students' dramatizations will be used to determine students' understanding of the effect of land slippage on the Scotland District area.

### **CLOSURE:**

Display a picture which gives evidence of the land slippage which occurs in the Scotland District.

Ask a volunteer to explain why the Scotland District is prone to landslides.

### **FOLLOW-UP ACTIVITY:**

### **EVALUATION:**

This class did not go well. Students were restless since they were disinterested in the activities which were planned. While visual aids were used to help students to meet the objectives the strategies and activities planned were not successful in getting students to meet the objectives of the lesson. These strategies and activities seemed to be forced into the lesson rather than emerging naturally from the objectives desired.

It would have been more useful to make use of the discussion method than have students engaged in dramatizations. While I felt as though I wanted to try this method since it had only been used once before in the class I learnt that there needs to be a clear link between methods and activities. The use of cooperative learning was also ineffective since the activity which the groups were engaged came at the end of the lesson (the dramatizations).

The generalization which was used in the lesson was not well constructed. The generalization included specific reference to Barbados and therefore could not be considered a generalization. This needed to be written as follows: When protective layers of rocks are

removed from the surface the exposure of more vulnerable layers results in erosion and landslides.

This was perhaps the worst lesson taught. However, it is important to recognize the mistakes that are made in order to plan better lessons for class. One of the major lessons learnt from this class is that classroom management becomes an issue when students are not engaged in the lesson.

**DATE:** 2010-04-16

**TIME:** 1:20-2:40

**DURATION:** 80 mins

**FORM:** 1 ALPHA 2

**AGE RANGE:** 11-12 years

**SUBJECT:** Geography

**TOPIC:** Physical Regions of Barbados

**GENERALIZATIONS:**

- A physical map is used to show the physical features and regions in a geographical area.
- When an area has similar characteristics it forms a region.

**CONCEPTS:** physical map, region, landscape

**OBJECTIVES:**

1. Describe the landscape of each physical region in Barbados.
2. Label the parishes in Barbados.
3. Identify the eight physical regions in Barbados.
4. Label the eight physical regions in Barbados.
5. Create a table to show the distribution of the physical regions in the parishes of Barbados.

**TEACHING STRATEGIES/METHODS:**

Guided Discovery

Cooperative Group: Learning Together

**TECHNOLOGY/MATERIALS:**

3-D model of Barbados

Overhead Projector

Smart Board

Laptop

Multimedia Projector

**SET INDUCTION:**

Ask students to sit in their cooperative groups.

Ask students to identify the different rooms in their homes.

Ask students to identify the characteristics which are used to classify the different rooms in their homes.

Inform students that each room can be thought of as a different region because each room contains different characteristics.

Inform students that Barbados can be divided into different physical regions because each region has a different landscape.

Ask students to describe the difference in the landscape of Oistins and Church Hill (location of the school).

Inform students that the difference between these landscapes make them belong to different physical regions in Barbados.

Inform the students that they will be exploring the physical regions of Barbados.

**LEARNING ACTIVITIES/EXPERIENCES:**

Display a model of Barbados to the students.

Ask students to examine the model of Barbados to determine the number of physical regions in Barbados.

Ask students to describe each of the physical regions based on the model.  
 Provide feedback on student responses.  
 Project a map of Barbados showing the physical regions.  
 Ask students to identify the type of map which is displayed.  
 Ask students to define a physical map.  
 Ask students to label the physical regions of Barbados.  
 Project a political map of Barbados.  
 Ask students to identify the parishes in Barbados.  
 Superimpose the political map on the physical region map and project this.  
 Use a green marker to show the boundaries for each physical region on the physical region map and a red marker to show the parish boundaries on the political map.  
 Ask students what information can be gained from placing both maps together.  
 Demonstrate how students may determine the physical regions which are found in a parish using St. Lucy as the example.  
 Ask students to work in their groups to create a table which shows the distribution of the physical regions of Barbados according to the parishes.

#### **ASSESSMENT PROCEDURES:**

Students will describe each physical region of Barbados.  
 Students will create a table to show the distribution of physical regions according to the parishes. This will be collected and graded.

#### **CLOSURE:**

Ask students the following questions:

1. What information can be gained from a physical map?
2. Why does Barbados have eight physical regions?
3. What are the eight physical regions in Barbados?

Students will volunteer to answer these questions.

Ask students to submit their books.

#### **FOLLOW-UP ACTIVITY:**

#### **EVALUATION:**

The set induction helped students understand the concept of a region and was quite helpful in making students understand how the regions are determined. I liked how it was able to help students make the link between what they knew and what they were learning.

The use of the 3-D model was quite impactful. Students demonstrated a good understanding of how the landscape of how the different areas in Barbados led to the different physical regions. It would have been better however to have created a smaller model for each group to work with since the model required that some students had to stand behind those sitting in the front rows to see the differences in the landscape. This could also have allowed cooperative grouping to be used more effectively in the classroom since the students would have been able to do the descriptions in their groups.

The use of the overhead projector and smart board was also effective since I did not know how to have the two maps superimposed using the smart board alone. Learning how to use the smart board more effectively is an area that I would like to concentrate on. That said students were able to interact with the technology.

Students were quite excited about labeling the maps. Better thought could have been put into determining the order in which students labeled the map. Students were asked to volunteer by

raising their hands. This created some confusion since most of the students were interested in participating in the activity. Here, I could have numbered each parish as was done for the physical region. Each group could have been assigned a number of each parish and a number of a physical region. Then, one group member could have interacted with the technology to do the labeling. This would also allow each student to feel that he or she participated in the exercise and would also have helped those students who could not remember the location of the parishes in Barbados.

#### *Procedure*

At the end of the unit of study, students completed a unit test. While scores on a test do not directly measure students' attitudes towards geography educators generally believe that positive attitudes towards learning is positively correlated with student performance. These scores were compared to the scores students received at the end of the first term.

The scores were recorded in Microsoft Excel 2003 and the mean scores determined for the end of unit test and the end of term marks.

Students also completed a questionnaire (refer to Appendix A) which served to evaluate the use of audio visual aids. Each answer, ranging from strongly agree to strongly disagree was recorded in a table for each of the statements from Section A of the questionnaire.

#### Results

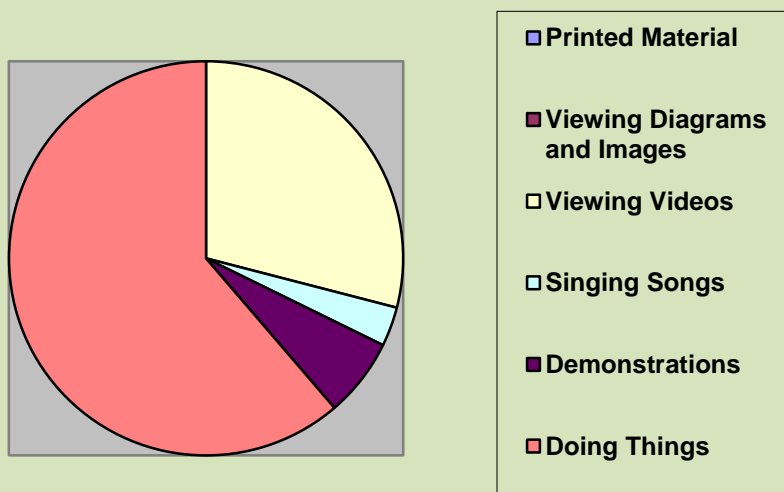
Section A: Results show that the attitude students held towards geography were largely positive. For each of the questions in this section students reported a liking for geography and the way in which they were taught. Most students (30) attributed their interest in a subject as being dependent on how the teacher teaches. 25 students either strongly agreed or agreed that they are interested in learning more about geography. 28 students reported that they would pay more attention in geography if the teacher taught in the way classes were conducted during teaching practice.

Item on Questionnaire	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
1	58.1	32.3	3.2	3.2	3.2
2	38.7	19.4	32.2	6.5	3.2
3	0	0	0	0	0
4	45.2	25.8	19.4	6.5	3.2
5	48.4	45.1	3.2	0	3.2
6	51.6	29.0	9.7	6.5	3.2
7	80.6	16.1	0	3.2	0

**Table 1: Shows the Feelings of Students towards the Geography Lessons**

Section 2 (Part A): Questions 8 to 13 sought to determine students’ learning preference.

Figure 1 shows learning through doing things was the most popular choice; 19 students selecting this option. 9 students reported that they preferred to learn though the use of videos. None of the students selected the use of printed material such as books and handouts. None of the students selected viewing images or diagrams.



**Figure 1: Shows the Activities Students Prefer**

Section 2 (Part B): Students were asked to indicate the top three activities which would have been used in lessons during the period of teaching practice. 100% of the students included interacting with the Smart board as one of the top three activities used. Being able to conduct experiments was also included in the top three activities of all the students. The creation of diagram of Barbados' formation was included in 70% of student responses. The activity booklet and use of songs on the rock cycle and the formation of Barbados failed to be included in the top three activities of any of the students.

Comparison of Students' Performance at the End of Term 1 and End of Unit Test for the Duration of teaching Practice: The mean score obtained by students on the end of term 1 was calculated 75.0% while a slightly lower mean (69. 6%) was obtained from the end of unit test. The performances of the students were therefore generally high. While none of the students received scores which fell below the pass mark of the school (45%) at the end of term 1, 3 students (Kevone Blackman, Tremaine Jervis and Tremaine Greaves) had failing grades on the end of unit test. Another 3 students had significantly lower scores on the end of unit test when compared to their end of term performance (Annette Gill, Simone King and Livion Crawford). Overall, however students' performance on the end of unit test was quite similar to their performance on the end of term test. (Refer to Appendix B).

#### Discussion

*Effectiveness of the Use of Visual Aids:* The results of the action research are consistent with the literature. The majority of the students held positive attitudes towards geography. Students see their attitudes as being influenced by the instructional methods or materials which the teacher uses within the classroom. 30 of the 31 students who completed the questionnaire indicated that it was the way in which a teacher taught which made them interested in a particular subject (refer to Table 1).



The audio visual aids which appeared to have been more effective in the classroom are Smart Board, interaction with real objects to conduct experiments and student created diagrams.

What these aids held in common is that they promoted a greater level of involvement and activity from the students themselves. This supports the view of John Dewey and Mahatma Gandhi in Kochhar (1983) that students need to be actively involved in the learning process.

19 students indicated that learning by doing things was their preferred way to learn in the classroom. The use of audio visual aids which allowed students to “do things” was therefore selected by the students as the top activities in the classroom.

More learning styles are catered to with the use of the Smart Board, interaction with real objects to conduct experiments, student created diagrams and viewing videos. The selection of these activities by a large percentage of students in the class seems to be related to the ability of these activities to cater to more than one learning style. Those activities which could appeal to only one learning style were also the activities which were least popular amongst the students (the use of the activity booklet and viewing diagrams and images).

Apart from the reasons given above for the popularity of the Smart Board in the classroom, this is a new form of technology which was only introduced to the students during teaching practice. Students had indicated that they did not use the Smart Board in any other class except geography. Its popularity with the students outside of the benefits indicated above is the novelty of the board to the students. Whether students selected Smart board activities as being amongst the top three activities because of its effectiveness as a learning aid could not be determined.

Like the Smart board, all the students included the interaction with real objects to conduct experiments as one of the top three activities. Again, like the Smart board the use of experiments was new to the students which seemed to have influenced its choice. Students at this level do not get many opportunities to engage in experimentation.

The interaction with real objects to conduct the experiments is also the most concrete learning aid used in the classroom with the students. Examination of the end of unit test (Refer to Appendix C) revealed that the students performed well in those areas which were taught using the method of experimentation (Questions 6 and 7a). The student who gained the lowest score on the test (Kevone Blackman) received 8 of a maximum score of 10 for these two questions.

As suggested in Dale's Cone of Experience and Bruner's labels for instructional activities concrete experiences are the foundation stages towards leading students to understanding abstract concepts (Heinich, 2002). This is perhaps one of the reasons why experimentation was favored by all of the students. The use of the cake and straw to help students to understand cross-sections was an effective experiment.

*Comparison of Scores on the End of Term and End of Unit Test:* While the mean score obtained for the students' performance on the end of unit test was lower than the mean score calculated for the end of term marks this does not indicate that the use of audio visual aids was ineffective. Even though this action research focuses on activities done during teaching practice it must be noted that similar activities were used during the first term. As such, students had been exposed to the use of audio visual aids prior to the action research. This could explain why the mean score in the end of term was slightly higher than that from the end of unit test.

In addition, the end of unit test score is a single score while the end of term mark was derived from a number of assessments which students would have taken. Literature on assessments questions the validity of evaluating student performance when a single test is used. Thus, other factors perhaps contributed to the difference between these two scores.

### Conclusion

1. Positive students' attitudes can be developed by the use of audio visual aids which allow students to be actively involved in the lesson.
2. Students prefer the use of audio visual aids which allow them to be actively involved in the lesson.

### Recommendations

It is important that the teaching of geography involves the use of audio visual aids to enhance instruction. There needs to be greater availability of audio visual aids to enhance the instruction within the geography classroom. Not only should teachers invest time in the creation of these materials but greater resources must be provided for teachers to create these materials, source appropriate materials and learn how to use audio visual aids within the classroom.

The use of experiments within geography should be utilized where appropriate to enhance geography instruction through the active involvement of students. The idea of geography as a science and an art must be showcased in the methods which teachers adopt.

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## Appendix A

**COPY OF QUESTIONNAIRE**

Please answer EACH of the following questions honestly. Thank you for your participation.

**SECTION 1**

Answer the questions in this section by writing the number which best expresses your feelings of the following statements:

STRONGLY AGREE	1
AGREE	2
NEUTRAL	3
DISAGREE	4
STRONGLY DISAGREE	5

1. I would pay more attention in geography if my teacher taught this way all the time.  
\_\_\_\_\_
2. After the lessons, I am beginning to like geography more. \_\_\_\_\_
3. After the lessons, I am afraid to ask questions in geography class. \_\_\_\_\_
4. I look forward to geography class. \_\_\_\_\_
5. I think it is important to learn about geography. \_\_\_\_\_
6. I am interested in learning more about geography. \_\_\_\_\_
7. I believe that whether I am interested in a subject is related to how my teacher teaches. \_\_\_\_\_

**SECTION 2****Part A**

Select ONE statement from the list below which MOST reflects the way in which you would prefer to learn geography. Put a TICK next to the statement.

8. I prefer using a book.
9. I prefer viewing diagrams or images. E.g cross-sectional diagrams
10. I prefer viewing videos. E.g types of rocks videos
11. I prefer observing the teacher demonstrating something E.g peas and rice to show stratification
12. I prefer singing songs which deal with the topic.
13. I prefer doing things E.g making diagrams and conducting experiments.

Part B

Assign a number (1 to 3) to show your top three activities used in the classroom.

14. Using the activity booklet to learn about types of rocks
15. Interacting with the Smart Board
16. Creating diagrams of Barbados' formation
17. Conducting experiments E.g limestone experiment, cakey island and pumice floating in water
18. Viewing diagrams and images of Barbados e.g cross-sectional diagrams
19. Watching a video of types of rocks on the computer
20. Observing a demonstration E.g rice and peas poured into a beaker to show stratification
21. Singing songs E.g rock cycle, formation of Barbados songs
22. The use of models in the classroom E.g model of Barbados and model of volcano

Thank you for your participation!!!

## Appendix B

FORM: 1 ALPHA 2				
SURNAME	FIRST NAME	GENDER	END OF TERM (%)	END OF UNIT (%)
CALLENDER	Ashlee	F	72	71
CLARKE	Kai	F	86	88
CLARKE	Kaleah	F	66	50
COX	Shaina	F	69	65
DAVIS	Gaidel	F	72	88
GILL	Annette	F	76	53
GITTENS	Claire	F	69	71
GREENIDGE	Cherise	F	79	82
HEADLEY	Arielle	F	NA*	94
HOLDER	Janei	F	52	65
KELLMAN	Kelsia	F	83	88
KING	Simone	F	80	53
MAYERS-BLACKMAN	Dejah	F	73	71
MOORE	Tessalee	F	76	72
PHILLIPS	Shadika	F	86	66
RICHARDS	Xhane	F	87	95
ANNAVILLE	Curtis	M	70	82
BARTLETT	Tre-O'neal	M	80	76
BLACKMAN	Kevone	M	NA*	41
BRATHWAITE	Mikhail	M	77	71
CRAWFORD	Livion	M	78	47
DIAZ	Williams	M	68	65
FARNUM	Alex	M	75	82
GREAVES	Tremaine	M	59	42
HOLDER	Seth	M	71	65
JERVIS	Dominic	M	69	53
MUSTOR	Alec	M	83	76
NURSE	Shakeem	M	90	80
PROVERBS	Nathaniel	M	73	76
ROUSE	Neal	M	85	71
TROTMAN	Ramon	M	69	57
WILLIAMS Clarence		M	76	72

\* Students were absent for a prolonged period during the term and were unable to complete the minimum number of assessments.

## Appendix D

TABLE OF SPECIFICATIONS

Objectives	Knowledge	Comprehension	Application	# of Items on Test
1. Identify types of rocks	X			3
2. Describe how a rock may be formed	X			1
3. Classify rocks into types	X			1
4. Draw a diagram to show formation of Barbados	X			2
5. Explain the formation of Barbados		X		2
6. Describe an experiment to test for the presence of limestone rock	X			1
7. Interpret the results of an experiment on testing for the presence of limestone rock			X	1
8. Define the term cross section	X			1
9. Locating an area on cross section not covered by coral cap		X		1
10. Name area not covered by coral cap	X			1
11. Justify why the Scotland District area may not be a suitable location to reside			X	1
12. Label physical regions in Barbados	X			4
13. Identify physical regions found in parishes in Barbados	X			2



