

The use of the chalkboard and computers in the teaching of mathematics in seconda...

[Education](#)



1. INTRODUCTION 1. 1. Education There are many definitions of education given by individuals and organisations which reflect their philosophies and objectives. R. S. Peterson (1966) defined education as the intentionally bringing about of a mental process that is instrumental to something that is worthwhile. Education produces a relative permanent change in the individual which enables him to acquire, use and transmit intrinsic and extrinsic cultural values from skills and attitudes to the next generation.

From my own point of view, education is the continuous process of bringing about a relatively permanent change in man with the ultimate aim of enabling him to use the resources in his environment (like knowledge, skills, attitudes, values, money, communication facilities, recreational facilities, etc.) to live a life that is psychologically, socially, spiritually, politically, physically and economically balanced and beneficial to the himself and the society at large. For all this to be effectively achieved there is need for the use of technology in the teaching-learning process. . 2. Technology Technology is the systematic application of scientific or other organized knowledge to practical tasks (Timothy et al, 1996). It is both a process and a product. It deals with audiovisuals, tools, techniques, systems and the relationship of these elements to human beings. Thus, Encarta (2005) defines technology as the purposeful human activity which involves designing and making products as diverse as clothing, foods, artefacts, machines, structures, electronic devices and computer systems, collectively often referred to as “ the made world”.

Technology is the special kind of knowledge which technologists use when solving practical problems (for example, designing and building an irrigation
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system for tropical agriculture). Such work often begins with a human want (for example, better safety for an infant passenger in a car) or an aspiration (for example, to see the inside of a human artery or to land on the Moon), and technologists draw on resources of many kinds including visual imagination, technical skills, tools, and scientific and other branches of knowledge. Educational technology is a special type of technology required in education. 1. 3.

Educational technology With the background on technology, the Association for Educational Communication and Technology (ACET, 1977) defined educational technology as a complex, integrated process involving people, procedures, ideas, devices and organization, for analysing problems and devising, implementing, evaluating and managing solutions to those problems in situations involved in all aspects of human learning. In educational technology, the solutions to problems take the form of all the 'learning resources' that are designed and or selected as messages, people materials, devices, techniques, and settings.

At this juncture it will be superfluous to continue without distinguishing between the content and context of educational technology. 1. 4. The content of educational technology The content of educational technology refers to the scientific material used in education to help facilitate teaching and learning. These materials range from simple visual aids as living objects and non living objects like pictures, drawings, charts, graphs, etc. to audio material which make use of the sense of hearing (like radios, record players, tape players, learning machines, etc. , audio-visual aids which make use of

both hearing and sight (like televisions, tape movies, etc.) to more advanced materials like computers , internets, the mass media and other communication devices as mobile phones, mobile phones with capacity to receive and send radio and television signals, others such as overhead projectors, dictaphones, books, teaching machine, libraries, laboratories etc.

1. 5. The context of educational technology The context of educational technology refers to the scientific way of using scientific material in education.

The process of planning, and using a variety of products or devices to disseminate education content and finally to evaluate achievement is referred to as instructional technology. Instructional technology is defined as a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction (Nkemnji, 2000). In simple terms the context of educational technology refers to teaching methods like the lecture method, discussion method, etc. with or without the technological material.

1. 6. Teaching and learning Teaching and learning are very important terms in the definition of educational technology. Nsamenang (2004) defines teaching as causing someone to learn or the facilitation of learning. On the basis of this definition, effective teaching takes place ONLY when it leads to effective learning. In this same vein, Atamja (2008) defines a “ teacher” as a person in school who is responsible for the education of pupils.

Teaching therefore includes the passing on of knowledge and skills, guiding and directing the acquisition of knowledge and skills, training of learners to acquire knowledge and skills, training of learners on the use of scientific approaches, living an exemplary life (the teacher should be a role model in society), as well as bringing about a positive or worthwhile change in the learner's behaviour. Learning is the other side of all of these which develops the personality and makes the individual useful to him/herself and the society.

Learning is a relatively permanent change in the learner's knowledge and behaviour (Mayer, 1982). It is the acquisition of knowledge, skills and attitudes which brings about relative change in one's level of knowledge and ability. The individual doing the learning is the student or pupil who is at the centre of the teaching learning process. Thus as Nsamenang (2004) opines that teaching should be learner-centred. In this respect educational technology can be defined as the use of scientific knowledge to produce scientific materials, and the scientific methods of using the material to enhance the teaching-learning process.

As seen above there are many items involved in educational technology but the discussion in this paper will be focused on how the chalkboard and the computer can be used in the teaching and learning of Mathematics in form five in the Cameroonian educational system. Considering the emphasis placed on Mathematics, one can observe that the performance of students in Mathematics is relatively poor despite efforts being made by students,

teachers and the administration in most schools probably due to the insufficient or ineffective application of educational technology.

In this regards, the meaning of each of these two items will be discussed followed by its use in the teaching of Mathematics as well as the advantages and disadvantages of using it. 2. THE CHALKBOARD A chalkboard is a reusable writing surface on which text or drawings are made with sticks of calcium sulphate, known, when used for this purpose, as chalk. Chalkboards were originally made of smooth, thin sheets of black or dark grey slate stone. Modern versions can also be green or brown and are thus sometimes called a greenboard or brownboard instead.

The colour of the chalk is always different and in contrast to that of the board in order to ensure good visibility. The size of chalkboards differs from school to school. Black chalkboards or blackboards are shown in Fig. 1. and Fig. 2 above. Its main purpose is to assist teachers in demonstrating and clarifying difficult concepts. 2. 1. Etymology and history of the chalkboard The term “blackboard” dates from around 1815 to 182 while the newer and predominantly American term, “chalkboard” dates from 1935 to 1940 (Wikipedia, 2008) 2. 2.

Design A chalkboard can simply be a piece of board painted with matte dark paint (usually black or dark green). A more modern variation consists of a coiled sheet of plastic drawn across two parallel rollers, which can be scrolled to create additional writing space while saving what has been written. The highest grade chalkboards are made of rougher version porcelain enamelled steel (black, green, blue or sometimes other colours). Porcelain is very hard

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wearing and chalkboards made of porcelain usually last 10–20 years in intensive use.

In most of schools in Cameroon with permanent buildings permanent blackboards are attached on the front wall of the classrooms. Other chalkboards are mounted on movable stands while others are simply movable pieces of frame plywoods which can be hung on the front wall when needed. Chalk marks can be easily wiped off with a damp cloth, a sponge or a special chalkboard eraser consisting of a block of wood covered by a felt pad. However, chalk marks made on some types of wet chalkboard can be difficult to remove.

2. 3. Chalk sticks

Sticks of processed “ chalk” are produced especially for use with chalkboards in white and also in various colours. These are not actually made from chalk rock but from calcium sulphate in its dihydrate form, gypsum (Wikipedia, 2008).

2. 4. Uses of the chalkboard

Chalkboards are often used in teaching, although in wealthier countries their use has diminished. University lecture theatres may contain a number of chalkboards in a grid arrangement, with each column mounted on rollers to allow the lecturer to move boards into reach for writing and then move them out of reach, allowing a large amount of material to be shown simultaneously.

Chalkboards are also used in many establishments (typically public houses) as a form of advertising often for upcoming events, menus and to record the score in darts matches. The chalkboard is probably the most frequently used visual training aid. It can be used at any time during a lesson to display

terms, definitions, examples, problems, drawings, or diagrams. Their flexibility allows one to adapt them to almost any instructional need.

Since they are available in most classrooms, labs, and shops, they are an excellent tool for recording student responses, encouraging class involvement, and note taking. The teacher can use the chalkboard when teaching almost any knowledge subject. The chalkboard is very essential in the teaching of Mathematics especially in form five where solutions of problems are to be gently presented on the board so that the students can follow the steps involved.

The teacher also demonstrates how to write new mathematical symbols like on the chalkboard so that the students can learn how to write them correctly.

2. 5. Preparation When a teacher plans to use the chalkboard in teaching Mathematics in a class like form five, he needs to take several steps before his presentation. He has to gather all materials required (e. g. chalk, eraser, ruler, pair of compass, protractor, triangle, etc.) for the chalkboard portion of the lesson and place them in the classroom. He has to clean the chalkboard before using it.

Also he determines which parts of the lesson are important enough to emphasize with board work so that it can help students meet the objectives. Information should clearly relate to the objectives of the lesson. Also determine the amount of time the board work will take and how it will look when finished. He has to ensure that the information will fit in smoothly with the lesson. That will help him to build confidence in using the board and to

reduce the amount of time to be spent erasing and rewriting or redrawing information. 2. 6. Presentation

Any work on the chalkboard should be with good layout, simple and clear (Anja, 2006). The following important points should be remembered when using to teach Mathematics and other subjects as well: 2. 6. 1. Layout: Chalkboard work whether a summary of a lesson, sketches or a combination of both should be set out orderly and attractively so that the students can see, read and copy with ease and interest. Chalkboard orderliness has an impact on the students' style of notebook keeping arrangement and tidiness. For orderliness and neatness on the chalkboard, the chalkboard should be partitioned into three sections.

The first section is the smallest and it is used for writing the objectives and the points that students need to remember. At the end of the lesson this section is used to summarize the lesson. The subject title and the date are written at the top of the middle section which is the largest. At the beginning of the presentation the title of the teachable unit or lesson for the period is written below the subject title in the middle section and the objectives are presented in the first section. The subject matter which the students are to copy is presented in the middle section with points of emphasis also written in the first section.

The third section is used for illustrations, sketches and spellings of new words. It is wiped as soon as the material is presented in the middle section.

2. 6. 2. Simplicity: All writings or drawings during the lesson should be brief and straight to the point. Prolonged writing or drawing disrupts the flow of

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the lesson and may cause the students to become distracted or bored. The teacher can write a comment or draw a portion of a diagram on the board and then turn to the class to solicit input and generate discussion about the information.

This technique promotes good eye contact and encourages class participation. When preparing a chalkboard drawing, some type of drawing aid should be used to keep the drawing as neat as possible. Compasses might be used for drawing circles and a ruler for drawing straight lines. Detailed diagrams should be drawn on the stand-by or spare board. Without too much artistic work the teacher should present good meaningful diagrams on the chalkboard. Simple drawings and neat sketches and diagrams should be used.

Only the essential points should be written on the board while the unnecessary details are kept out. 2. 6. 3. Clarity: The writing on the chalkboard should be from left to right in straight horizontal lines. Colours that are visible to all the students in the classroom can be used to increase the perception and for emphasis on important points like formulas . Besides using neat and legible handwriting, correct spelling and grammar should be used. Incorrect spelling and poor grammar are not only detrimental to the students, but may discredit the teacher.

The teacher should always check this legibility, proper spellings and grammar by moving back and reading what is on the board from the students' view point. When using a pointer to draw attention to a point or drawing, the arm should be kept straight while pointing. The pointer is

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considered as an extension of the arm. The hand nearest the object is used to point out instead of allowing the arm to cross the body. It is advisable to stand to one side as shown in Fig. 1. and Fig. 2. above to prevent obstructing the students' view, and to avoid talking to the chalkboard.

When the instructor talks to the board, students have difficulty understanding his words, and he loses eye contact. The teacher can pause frequently to maintain students' attention. The teacher should explain what he is doing and check for students' reaction. Additionally, check the drawing or writing from the students' viewpoint will be very helpful in identifying errors. The chalkboard work should be logically presented. It should be sequenced so that the relationship of each new item to the previous is readily apparent.

Concepts, procedures, diagrams and other information should be developed step-by-step and in the most logical sequence. Chalkboard information is used to develop one point at a time with progress from the simple to complex. For example, when teaching how to solve quadratic equations using the quadratic formula: Students should be able to demonstrate that some quadratic equations cannot be solved by factorisation because this will enable them to identify the importance of the lesson to be presented.

It is advisable to proceed from the identification of the standard form of a quadratic equation to the identification of coefficients, finding the determinant, stating the formula correctly, substituting in the formula correctly and simplifying to get the solutions. During the presentation, the board should be kept as clean as possible. All the information in the third

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section of the board that is not being used should be erased. A cluttered board with scattered, unrelated materials hinders the presentation and student understanding.

The duster should be kept back in the duster tray when the teacher finishes making a point. The teacher should not cause a distraction by rubbing himself with the duster or by carrying it around. Also, the teacher should avoid walking in front of displayed information whenever possible. At the end of the lesson the teacher should keep the board clean before leaving so as to prevent it from becoming a distraction.

2. 7. Care of the chalkboard

Everything that is useful must be subjected to good care. The chalkboard needs maintenance. They should be properly cleaned before and after use.

Chalkboards that have rough or smooth surfaces should regularly be renovated. Teachers and students can improvise local materials for renovating their classroom chalkboards. In Cameroon a mixture of ground charcoal, sweet potato leaves and water is often used locally to renovate the blackboard. The mixture is applied uniformly to the board. Boards renovated in this way may dirty hands when used but this serves the purpose of improving visibility. There are other green leaves which can be used for this purpose and teachers are encouraged to explore more areas for renovation of chalkboards in their schools.

8. Advantages ? Demonstration and clarification of difficult concepts:

Its main purpose is to assist teachers in demonstrating and clarifying difficult concepts. The way this works; the chalkboard provides a visual dimension along with an oral presentation. Most people forget what they hear in a relatively short time and have difficulty

recalling the information accurately. On the other hand, things they see make a more lasting impression and help them to recall the object or process more accurately.

Students can recall the mental images created by pictures and models presented on the chalkboard, more easily than when they are only mentioned verbally because of their increased interest at the time of reception. ? Visual aid: It can also be used as a visual aid such as in giving assignments without too much oral interpretation on the teacher's part and can help students with drill work in many classes. In a Mathematics class, the teacher can explain a certain problem by demonstrating it on the chalkboard. Then, the students can go to the board to drill on problems.

In fact, the chalkboard is one of the most effective devices that can help students to see and comprehend quickly ? The chalkboard is readily available: Chalkboards do not usually have to be scheduled. The teacher may use them at any time during a lesson to display terms, definitions, examples, problems, drawings, or diagrams. Since most chalkboards are on hard surfaces, the teacher may easily display information on them using cello tape or poster board with magnets attached (if the board has a metal backing).

Their flexibility allows teachers to adapt them to almost any instructional need. Since they are available in most classrooms, labs, and shops, they are an excellent tool for recording student responses, encouraging class involvement, and note taking. The teacher can use the chalkboard when teaching almost any knowledge subject. ? The chalkboard is versatile: It can

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be used for a wide variety of purposes by both the teachers and the students. Illustration of ideas: The chalkboard is very useful for showing symbolic diagrams where ideas take precedence over visual form. The use of diagrams for illustrations is symbolic and interests students to talk and write about them. ? Recording new words: In discussing any diagram or explaining any concept or something, the teacher uses the chalkboard to write words deemed to be new and difficult to the students. ? Showing relationships of ideas in developing sequence: The teacher can emphasize important facts on the chalkboard by writing and sketching diagrams and explaining systematically, leaving out trivial and accidental aspects.

It is here the teacher can employ the use of appropriate resource materials to reinforce proper understanding of the lesson. It is also here that the chalkboard assumes the role of a powerful medium. Writing using the board during a lesson the teacher can arouse students' curiosity and hold their attention for effective learning. 2. 9. Drawbacks or disadvantages The use of the chalkboard has some limitations or shortcomings. ? Chalk dust: The use of chalkboards produce dust, the amount depending on the quality of chalk used.

Some people find this uncomfortable or may be allergic to it, and there has been speculation about links between chalk dust and respiratory problems albeit this has not been proven. The dust also precludes the use of chalk in areas shared with dust-sensitive equipment such as computers. With the increasing presence of computers in classrooms, the potential impact of chalk dust has been a stated concern. Dust can damage computers, and

chalk is, essentially, compressed dust. Yet this appears to be less of an issue with many than it sounds. Difficulty in writing without turning the back to students: The major disadvantage of the chalkboard is that it can be difficult sometimes for the teacher to write on the board without turning his back to the students. ? Not portable: Most chalkboards are not movable and must be used where they are. ? Reflection of light: Very smooth chalkboards tend to reflect too much light and make it difficult for students to read what is written on it. ? Difficulty in reading from all sections: In large classes it is difficult for all students to read from all the three sections of the board.

As such the teacher may be forced to write only in the middle where all the students can see. ? Inaccuracy of chalkboard diagrams: The simplicity of chalkboard diagrams limits their usefulness since the diagrams like graphs and maps cannot show exactly what the symbol actually represents. Thus chalkboard diagrams are highly symbolic and can only be useful if the students have actually seen the real picture or diagram or understand clearly what the accurate diagram would have looked like. 3. The computer A Computer (shown in Fig. 3. above), is an electronic device that can receive a set of instructions, or program, and then carry out this program by performing calculations on numerical data or by manipulating other forms of information (Encarta, 2005). In developing countries as in Cameroon, teaching with the computer is a new concept but in the developed nations it is an old concept. Teaching with this method is about the computer and by the computer. About the computer means knowing or understanding the functioning of the computer instrument. By the computer on the other hand

means using the computer instrument in knowing specialist, service and survey courses.

Teaching by the computer is in three categories namely; specialist, service and survey courses. Specialist courses are programmes for training of computer experts such as computer engineers, analysts, programmers, etc. Service courses as the name implies are programmes designed in the computer to serve students do their assignments in subjects such as Mathematics, Physics, technology, etc. Survey courses are, however, computer classes intended to help students gain understanding concerning the strength and weaknesses of the computer instruments.

Teaching by the computer comes into two forms: computer managed instruction (CMI) and computer assisted instruction (CAI). With the CMI, the computer can be used to manage the activities of teaching, such as keeping students progress records, calculating marks, giving directions, preparing timetables, route students in rough appropriate curriculum; store communications; test; medical diagnoses; keep inventories; special programmes; analyse research data; etc. The discussion in this paper is focused only on the CAI. 3. 1. Computer Assisted Instruction (CAI)

Teachers can use the computer to assist instruction through drill and practice, tutorials, simulations, instructional games, problem solving and word processing. This means that in computer assisted instruction, a programmed computer can assist an individual student in his study, it can therefore be used to facilitate the learning of specific skills or tasks. The student can communicate with the computer through a keyboard or mouse.

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He has the liberty to do this at his own pace or leisure. Each time the student communicates with the computer, the computer will respond through the monitor screen.

The most prominent way by which computer assisted instruction can be applied is through drill and practice programmes for the acquisition of basic skills in science, mathematics and language. Problems are presented in small steps, learners are required to enter answers and receive feedbacks on the corrections. Tutorials are computer based teaching materials that make special efforts to respond to individual differences in learning. In tutorials, information or learning tasks in text or graphic form is presented to the learner to respond and the response compared with the correct answer stored in the computer's memory.

Correct responses are rewarded (with praises like " well done"). The use of simulation is highly recommended for the teaching of higher order skills and processes. The computer can simulate a number of complex situations to provide learners with the opportunities to learn specified skills, improve decision-making or problem solving skills. In a small class (with less than 10 students) a single computer placed in front of the class can be used. For effective learning to take place, it is advisable to use a multimedia system where many computers are used and each student is entitled to a computer.

In Cameroon's multimedia systems, few students are entitled to a computer because of the over crowded nature of classes (80-120 students in some classes).

3. 2. 1. Preparation: Preparation plays a key role in the learning process.

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Preparation of oneself, the materials, the environment, and the students can all impact the effectiveness of the instruction. There are a number of ways in which different media formats may be implemented within the instructional setting; however, general principles for the correct utilization of all media do exist.

The computer is a media format, thus the following general principles are equally applicable. The power point program is the best computer program for teaching Mathematics. The teacher should become familiar and comfortable with the media format. The equation editor and the power point are used to prepare the material to be taught in the form of slides. What the students are expected to gain from their learning experiences can be highlighted using carefully chosen colours. The prepared slides are store in a portable hard ware like a compact disc (CD) or flash.

The teacher then previews the material to make sure that he understands how to run the power point program. At this juncture the teacher has to ensure that all the students can see and hear all the explanations. He ensures that all the computers to be used can run the program without any problem. Before the lesson he checks the lighting and viewing angles to make certain that everyone can see the displayed image. The computer is position on a raised platform in front of the class in such a way that the teacher can observe the display and still maintain eye contact with the students.

The software is installed and tested in advance to make sure that everything works properly. 3. 2. 2. Presentation: During presentation the software

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should be run from the hard drive rather than from a floppy so that it can operate much more quickly. The screen displays and program operation should be kept simple so as to avoid unnecessary distractions. The presentation should be set to advance at the press of a button or the click of the mouse. Large font size should be used to display text. This greatly increases readability, especially in large rooms.

Student participation can be encouraged through questioning and having them decide next steps. When the teacher demonstrates software that students will eventually use, he should endeavour to point out features they'll need to know and be able to use during subsequent hands-on activities. NB: When a multimedia system is used the preparation should be as follows: ? Assemble and test all components to the multimedia system in advance. ? Connect all components with the power turned off. ? Install and test all software in advance of presentation. ? Check lighting.

Viewing angles and audio levels to make sure that all are appropriate. ? Plan follow-up discussions and activities to help students get the most from the presentation. 3. 2. 3. Evaluation: As seen above, problems are presented in small steps and learners are required to enter answers and receive feedbacks on the corrections. 3. 3. Merits of computer teaching method 1. Interactivity: Computers are excellent learning and teaching resources because of their interactive nature. The computer can present the information, elicit the learner's response, and evaluate the response. . Individualization: The computer's branching capabilities allow instruction to be tailored to the individual. The computer can provide immediate feedback

and monitor the learner's performance. 3. Motivation: Many learners find computers to be motivating. Computers can provide variety through the use of varied feedback, different approaches to content, and, to course, and multiple media. It can also be modified to be appealing to visually impaired learners as well as to learners with hearing difficulties. 4.

Learner control: Computers can give the user control of both the pace and the sequence of the instruction. It provides immediate feedback and keeps an ongoing accurate record of each student's progress. Thus, fast learners can speed through the program, while slower learners can take as much time as needed (branching). When teaching Mathematics, the teacher can stop and explain, replay, and point to areas of emphasis. 5. Distance learning: The computer can be used for distance learning when an internet line is connected to it. 6.

The microcomputer: The microcomputer is able to maximize the fundamental principles in teaching such as acquiring active student involvement achieving individual attention and providing continuing and accurate feedback about performance. 7. Storage of information: The computer can store vast amounts and retrieve such information in a rapid fashion. When employed in an information-accessing manner, the computer can be of additional assistance to teachers as well. For example, many curriculum programmes rely on continuous diagnostic prescriptive approach and demand an efficient means of storing and retrieving information on students' progress. . Facilitates the work of the teacher: Teaching using the computer can relieve the teacher of monitoring and correcting more routine

assignments of this nature and allows you to interact with other students in more diverse and demanding ways. 9. Highly challenging: Computer as a teaching method, tasks on more of a monitoring function, probing and challenging the student and allowing for more divergent and inductive modes of learning. 10. Economical: When the computers are already available it is very economical in providing revision questions especially multiple choice questions.

The cost of printing the questions as well as the time wasted in copying the questions will be avoided. It is also very possible for the teacher to prevent the questions from circulation so that they will remain challenging to students and can be used over and over. 3. 4. Demerits of computer teaching method 1. Start up cost: The cost of the computer itself and the necessary software may be limiting. Although delivery costs are often low, start-up and development costs for computer assisted instruction tend to be high. To integrate computer teaching with the classroom system will depend on the financial, material and human resources. . Lack of knowledge in using the computer: Many students come to classroom with no experience and skill in using the computer technology largely because of non availability and non involvement in computers at homes. 3. Expensive and insufficient equipment: Computers are complex and expensive media to be made available. Cost and access are barriers, especially with the limited budgets of many schools. In Cameroon, most classes are large and all the students cannot have access to the computers within a given period. 4. Can be distractive: Students may pay attention to the computer instead of the lesson.

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This demands effective supervision by the teacher. 5. Incompatibility: The lack of compatibility among the various brands of personal computers limits the transportability of computer assisted instruction. Developers cannot create a single computer assisted instruction package that will work across all types of computers. 6. Limited modalities: Most Computer assisted instruction relies on text and limited graphics. A heavy demand is placed on the learner's reading and visual skills. The visual and auditory cues that are common to live instruction tend to be absent from the computer assisted instruction. . Increased embezzlement among principals: The introduction of computer fees in most schools in Cameroon because of the high cost of maintenance and expensive nature of computers is an added burden to parents and gives room for embezzlement among many principals. Many of them either inflate the prices of computers and maintenance charges or they outdated computers doled from western countries which are never useful. 8. Environmental hazards: Most computers used in schools in developing countries last only for a short time and are beyond repairs.

Considering the fact that they contain heavy radio active metals like lead etc, it is quite hazardous to dispose them in places where people will get in contact with the emitted radiation. 4. CONCLUSION Besides having a good master of the subject matter the teacher must be familiar with the scientific material required to teach his course of instruction in order to be an effective instructor. He must use the approved lesson plan and personalize it to cover all discussion points exactly as he intend.

He should enrich his repertoire of methods to reinforce his lesson presentations and to provide students with the learning opportunities provided by these materials. When using instructional materials, the teacher should be prepared materials and practise using it in advance. He should also follow proper techniques when using these materials in the teaching-learning environment. The proper use of all course materials will greatly enhance the teacher's effectiveness as an instructor.

Technological material like graph boards, chalkboard rulers, triangles, protractors, compasses, geoboards, computers, wooded or plastic blocks, charts, maps, pictures, cards, etc. should be used to add interest as well as to supplement verbal explanations especially in the teaching of abstract concepts in Mathematics. In addition to the foregoing, teachers should encourage and guide learners to produce and use these materials. The use of technological material in the teaching-learning process makes the process more realistic and interesting. Models and simulators can also be used to enhance demonstrations. The use of computers in the teaching and learning of Mathematics as well as its usage in educations is highly recommended because every thing is becoming computerized and those who do not learn how to use it will soon be left behind. They will find it very difficult to fit themselves in computerized systems. Mathematics teachers in Cameroon should take this seriously because much of Mathematical research is done with the use of computers. Teachers should make an effort to learn and use computers because one reward of teaching is knowing that our life makes a difference.

From the foregoing, it can be concluded that technological materials give meaning to the instruction, but they cannot take the place of the effective instructor who has to ensure effective supervision of the use of these materials. REFERENCES A. Bame Nsamenang (2004). The teaching-learning transaction: An Africentric approach to educational psychology. HDRC Bamenda, Cameroon. George L. C. Atamja (2008). Teachers' Recommendations concerning their status and role. BUST, Bamenda. Methods of teaching Mathematics in secondary schools. Microsoft ® Encarta ® Encyclopedia (2005).

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