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Analysis of Learning Difficulties in a Mathematics Classroom Arising from School Organizations, Methodology and Curriculum

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Abstract: ***Mathematics is one of the subjects offered in secondary schools in Kenya that is poorly performed.This paper analyses the problems, difficulties arising from school organizations, methodology and curriculum. Normally we see that students have a fear towards the subject Mathematics. They are unable to understand the basic concepts of Mathematics and their technique due to various reasons. The problems that occur in the process of learning mathematics are relatively less in case of other subjects. Hence, there is a need to study in detail the problems faced both by students and teachers in learning and teaching mathematics. The academic mastery of a subject to be taught is of uttermost importance if the students are to achieve high academic standards So this study has been conducted with the sole objective of identifying various problems faced by students and teachers in learning mathematics and solicit suggestive Measure in favour of those.***

Keywords: school organizations, methodology, curriculum, academic mastery

1. Introduction

Mathematics acts as a "power generator" to social progress. A qualification of mathematics at Kenya Certificate of Secondary Education (K.C.S.E) level is considered as vital for many jobs as well as in the entry to University and College courses even if the course to be studied bears little connection to mathematics. Sidhu (1982) emphasizes that one cannot do without the use of fundamental process of the subject in daily life. According to Napoleon as quoted by Sidhu (1982), "The progress and improvement of mathematics are linked to the prosperity of the state". Cockcroft (1982) notes that "It would be very difficult perhaps impossible to have a normal life in very many parts of the world in the twentieth century without making use of mathematics of some kind". Any person ignorant of mathematics will be at the mercy or others and will be easily cheated. All professionals and non-professionals require the subject for the accomplishment of their work.

According to Mutunga and Breakell (1992), mathematics is a very important subject to the continued growth of any nation or society. It is used in science subjects and is increasingly being used in most social science subjects and arts. Arithmetic skills which have been learnt can be applied effectively and easily in the home, at work, and in leisure pursuits. Sidhu (1982) supports them by noting that, if taught in the right sense, it develops reasoning and thinking powers more and less from memory and the student comes to realize that thinking makes him a successful student of all the subjects. Orton and Frobisher (1996) observe that more mathematics lessons are taught in schools and colleges throughout the world than any other subject. In Kenya, second to English combined with Literature with the highest number of lessons, mathematics has six lessons in form one and two and seven in form three and four per week.

Due to the subject's core role in the country's development, the Ministry of Education in Kenya has made it a compulsory subject in the secondary school curriculum and set out twelve general objectives which the learner is expected to achieve by end of the four year programme. The objectives serve as an indicator that the country wants to produce future generations who are able to apply their mathematical knowledge and skills in a new technological context and every market place for its attainment of vision 2030. In that respect, the pressures on teachers of mathematics to make students perform well has increased from all quarters. Through partnership with development partners, the government has embraced several initiatives such as the strengthening of mathematics and science subjects in secondary schools (SMASSE) project. This is a joint venture between Japanese government through the Japanese international Development Agency (JICA). It was established in 1998 to improve the capacity of young Kenyans in science and mathematics through In-training (INSET) centre for mathematics and Technology Education in Africa (CEMASTEA News letter, 2008).

According to Orton (l987), some of the factors affecting mathematics performance include but are not limited to language of instruction, preferences and attitudes, gender and related differences, assessment practice and methods of instruction. Thwaites (1961) attributes this to poor attitude of mind towards teaching and learning of mathematics. Mathematics knowledge and understanding is critical not only for scientific progress and development but also for its day to day application in government, business, Management studies and household chores ,Mutunga and Breakell,(1992).

Mathematics difficulties are widespread .Upto 10% of students are diagnosed with a learning disability in mathematics at some point in their school careers. Barbaresi MJ, Katusic SK,

(2005), Shalev RS, (2005). Most children with difficulties in mathematics are characterized by weaknesses in secondary symbolic number sense related to whole numbers, number relations and number operations, Jordan NC, (2009)– areas that are malleable and influenced by experience. Case R, (1990). Foundations for mathematics achievement are established before children enter primary school. Clements DH, 2007, Cross CT, 2009. Mathematics difficulties and disabilities have their roots in weak number sense according to Landerl K,(2004), Mazzocco MM, (2005). Early number competencies are important for setting children's achievement trajectories in mathematics, Duncan GJ, (2007), Jordan NC, (2009). However, many more learners struggle in mathematics without a formal diagnosis. Interventions for learners with, or who are at risk of, mathematics learning difficulties should be devised and evaluated through randomized controlled studies Identification of key predictors of mathematics outcomes provides support for screening, intervention and progress monitoring before children fall seriously behind in school.

2. Sources of Difficulties

2.1 School organization

Few teachers are able to organize their classes exactly as they wish. They're bound by constraints of the overall timetable, staffing, and school policy. Difficulties will arise because teachers may not employ setting of classes that are not differentiated by ability. Most schools stream by general ability and hence difficulties to organize mixed ability sets in mathematics will usually arise. Many teachers for example prefer mixed ability classes of the younger groups but would rather have mature students streamed according to ability as the subject concepts in upper levels is considered complex. This they say makes explanations easier when dealing with pupils or roughly similar abilities. The demands of external examination encourage this kind of setting. It is worth noting that arranging pupils in a classes may create other difficulties if not utilized properly. This is so because the top achiever due to slowness of the pace and common syllabus feels restricted and therefore reduce this range of mathematical experiences. Meanwhile low activity class will do badly since both syllabus and pace are over demanding. Though a teacher may know the advantages of team teaching, he/she finds it difficult to implement it due to scarcity of teachers, diverse nature of available advise, staff opinion and resources and this affects school organization. It is therefore advisable for each school organization to have its own approach of reducing learning difficulties provided the teaching style and range of resources developed are appropriate to overall organization.

2.2 Classroom Methodology

Classroom methodology is linked to school organization, e.g. teachers/pupil ratio. A high teacher pupil ratio say 50:1 does not allow much personal attention low ratio is not better either, however teaching effectiveness increase with decreased pupil teacher ratio up to a certain point. Teaching style depend on class. The difficulties that arise teachers'' methodology include.

2.2.1 Teachers' inadequate presentation.

Inadequacy may be due to;

1) Overlooking gaps in pupils knowledge
2) Lack of clarity and structure and approach
3) It may be based to unwarranted assumptions concerning pupils' progress and ability
4) Insufficient emphasis given to key ideas
5) Appropriates activities such as practical work, drawing, measuring investigation or problem solving may not have been provided
6) Few straight forward examples to consolidate explanations
7) Pupils exercises may be badly graded and confusing or may be no more than routine and mechanical drawn from a single insufficiently comprehensive textbook
8) Lack of ongoing critical supervision and appropriate assessment adds to difficulties.

2.2.2 Pace of work

The speed at which the teacher develops a topic may be too rapid for some students even if the approach is satisfactory. No amount of consolidation and revision carried out at the same pace will improve matters. The pace at which the whole class is designed to proceed may cause unrealistic progress where coverage of syllabus at a certain time is common. Such courses developed with insufficient concern for pupils' needs and abilities foster failure and stress.

2.2.3 Unsuitability of learning resources.

There is no perfect textbook or work cards, however some products are better than others. Visual presentation is important for all age groups and levels of difficulty. Usually younger and lesser able students will not be alienated to the text with large paragraphs written in complex sentences lacking in illustrations, diagrams and drawings others may not like material content in cartoon characters. The balance of text and illustrations are important as well as layout. Provision of exercises is also an important factor, although textbook material can be supplemented and often should be, it is valuable that there should be reasonable program of well graded exercises in the main text, in some books and materials, grading is given sufficient attention. The second problem is a set of exercises may have the first exercise more difficult than the tenth. Similarly skills, which have not been taught or revised for some time, may appear in exercises and cause difficulties, which have not been anticipated.

Students will always be heard to say that the exercises are more difficult than the teachers' example. For example students practicing applications of distributive law may be making progress with examples such as $3(5x-7y)$ but be halted in their tracks by the unheralded appearance of $-(x+3y)$. Mixed set of exercises have a place in revision and consolidation but they must be planned for and pupils should know what to expect.

2.2.4 Topic sequencing

Difficulties can be caused for certain pupils because a necessary pre requisite skill for a new topic has not been encountered for some time. The benefits of a spiral curriculum may be greatly reduced if the spiral is not tight enough and there is not sufficiently frequently return to certain key topics.

2.2.5 Language levels

The language level employed by the teacher must be carefully adapted to the abilities and comprehension of his pupils. This is true equally for the written word. Learning mathematics is a challenge for many students and this becomes more challenging when the subject is taught in a second language. They need to listen to the teacher talking, presenting and explaining. They need to read textbooks and worksheets and they need to ask questions and discuss their ideas to improve understanding of mathematical concepts. A discussion on learning mathematics in a second language will be discussed during the session on ethno mathematics. Difficulties are encountered when less able students are hindered in their mathematical progress by some apparently simple words and phrases commonly used in mathematics. For example, student are invited to 'Complete a calculation' which they have not started or words like root product, odd, prime factor simply. These words have other meanings .e.g. product in geography and in mathematics. It is important that where technical vocabulary is employed care must be taken to ensure that pupils understand the mathematical meaning of the terms involved. Interaction of methodology and organization takes place though provision of additional individual attention of pupils at appropriate times, these can be achieved through co-operation between teachers of the same subject at school level and other forums such as subject associations.

Finally it is worth quoting what the Cockcroft report ***mathematics counts*** has to say about teaching style and methodology. It states that "mathematics teaching at all levels should include opportunities for:

- Exposition by the teacher
- Discussion between teacher and student and between the students themselves
- Appropriate practical work
- Consolidation and practice of fundamental skills and routines
- Problem solving, including the application of mathematics to everyday situations
- Investigation work."

However the report says that the list of activities does not guarantee good methodology. It is the context in which these activities take place, the importance attached to it and the relationship between them are the real determining factors.

2.3 The Mathematics curriculum.

There are basically three ways in which learning difficulties have their source in the curriculum

2.3.1 Lack of mastery of earlier content

An obvious example of his aspect is a student is who cannot manipulate integers is going to find difficulties in solving equations. In this case lack of ability with integer manipulation is fairly obvious, but sometimes the links are not clear. A student factoring expressions is handicapped if he/she has poor knowledge of basic multiplication facts, a handicap that can be overlooked because the teacher is concentrating on other concepts involved which are demanding in themselves.

2.3.2 Level of abstraction

The student may not be ready for the degree of abstraction expected. For example, geometry in our school is often presented in the abstract with very little practical work. Students are expected to grasp the properties of a parallelogram by looking at a drawing on the blackboard. Such drawings make the symmetry properties hard for students to appreciate, whereas cutting, folding and rotating shapes greatly reduces the difficulties of perception involved. Research on levels of thought development in geometry has been carried out by Van Hielle, who has identified the following five so called Hielle level.

Level (i): At this level pupils perceive geometric diagrams only in their totality, as entities seen according to their appearance. The pupils do not see

a) The individual parts of the figure
b) Relationships among component parts
c) Relationship between different figures.

Figure recognition is fairly easy since the figures are perceived only as complete shapes. This level can be described as global/descriptive.

Level (ii): Pupils now begin to see components of figures. Properties of shapes can be established experimentally, although not formally defined. This level can be defined as experimental/analytic. (Level (i) and (ii) altogether form a preliminary experimental stage based on practical situations and on drawing and measuring).

Level (iii): Pupils are able to establish relationships among the properties of a figure and among the figures themselves. They can discern the possibility of one property following from another. The process of teaching logical conclusions is developed, and the role of definition is clarified. This level can be described as deductive.

Level (iv): Pupils recognize the significance of deduction as a means of constructing and developing geometric theory. The role of axioms in this development becomes clear.

Level (v): At this final level, theories are developed without the need for any concrete interpretation. The first two are experimental in nature based on practical work, and that is only at level (iii) that deductive work appear. Teachers however treat geometry as though pupils are automatically capable of deduction and logical conclusion i.e. had reached the stage of formal operation thinking, aided only by textbooks and class instruction.

2.3.3 Innate ability

The third source of curriculum based learning difficulties concerns intelligence level. This is a source of contention. The views on this aspect remain personal because some people think that mathematics ability is not for every one. They insist that while some students may benefit from remedial tuition, some are late developers, there are also some pupils who may be prevented by low general ability from going beyond a certain clear point in a particular topic. It is also true that every child can achieve some measure of success in every mathematics lesson depending on the teacher's attitude and methodology.

3. Learning Difficulties Inherent in the Subject

The cause of learning difficulties inherent in the nature of mathematics may not be due simply to the poor curricular planning, although poor planning will undoubtedly exacerbate them, but stem from the nature of the subject itself, its thought process and its symbolism. There can be considered under the following areas;

1) The abstract nature of the concepts involved
2) The complexity of the concepts
3) The hierarchical nature of mathematics
4) The logical nature of mathematics
5) Formal notations
6) Formal algorithms
7) The concept and use of variables
8) Spatial concepts and geometric thinking.

Some of these areas when taken cumulatively, constitute for many pupils formidable hurdles to the learning of mathematics, of a nature peculiar to the subject.

3.1 The abstract nature of the concepts involved

Mathematics is quite mysterious to many people such that what at one moment seems fixed and clear cut at another appears to have altered beyond recognition. Consider for example the introduction of trigonometric functions, sine, cosine and tangent. These are frequently met in relation to right angles triangles with definitions formulated in terms of adjacent, opposite hypotenuse. The context is concerned with heights, distances and angles of elevation or depression. There is no mention of periodicity which has no meaning in the right-angled context), or functional nature. Later many pupils will deal with extensions of definition to angles laying between 90 degrees and 180 degrees in order to deal with arbitrary triangles. Even later we meet the full periodic function definitions of sine, cosine and tangent in the context of the coordinate system. However even the most able student finds it difficult to abandon the original right angled triangle definitions and in times of stress or uncertainty will attempt to revert to this. The final stage at school level in the process of abstraction, that is in the process of shedding of particular and non-essential mathematical features is the removal of the notion of angle from the definitions so that, for example in different calculus, the function $(sin(x)^2$ is meaningful, although the square of an angle is not. The onion like shedding of non-essential mathematical aspects of an idea is an inescapable aspect of a mathematical development. It must therefore be explicitly planned for in the teaching sequence. Learning difficulties in this area pose the greatest problems for non-specialists involved in mathematics teaching, since the teacher requires having a personal understanding of how and why the shedding process takes place. Much of the power of mathematics lies in the process of removal of layers in order to reach the heart of a mathematical idea. The fewer essential components an idea or concept has, the wider is its applicability. Abstraction and power go hand in hand.

3.2 Complexity of the concepts

Mathematics is complex. Underestimation of this complexity by the teacher may create learning difficulties. A teacher needs to analyze features of an idea (or concept or technique) which a learner must understand before he can be fully conversant with it. Only then is he/she able to construct activities and learning sequences, which will allow also the learner to become aware of those features in an appropriate progression. In attempting to overcome problems arising from the complexity of a mathematical idea, many teachers have resorted to various strategies such as

Simplicity through abstraction (a vector is a directed line segment)
Simplicity through analogy (-×-=+; two negative sentences represent a +ve sentence)
Simplicity through authority (it is the conventional method).

3.3 The hierarchical nature of mathematics

Mathematics is probably the most hierarchical subject in nature. If this hierarchy of content is allowed to dominate the teaching sequence, substantial learning difficulties, boredom and apathy will arise. It is therefore good practice to adopt a range of strategies designed to avoid or at any rate lessen the above consequences of too strict an adherence to the sequential nature of the subject. The strategies that could be used at the discretion of the teacher (all have pitfalls as well as advantages) are:

1) ***Looking ahead and relating expectations backwards.***
   Discussing the future direction of mathematical work with the students so that they can see where their work is leading, these helps to reduce the sense of boredom and purposelessness and the view that hierarchy is a strait jacket of thinking.
2) ***Topic switching***
   This is the case where a given topic is not dealt with in once and for all manner but is introduced and then returned to on a number of occasions with each time an increase in the scope and depth of treatment. This is built in the syllabus. Basing on the teachers observation of his pupils progress and attitudes, non-pre-planned switching of topics can take place. Well-organized teachers will have ready material to recapture pupil interest. The original topic can be returned to again later with a likely increase in pupil interest. Careful planning is required for the nature and positioning of such switching. Desirable switching can be

very successful in maintain pupil moral towards mathematics.

3) ***Starting afresh***
To avoid progressive difficulties, it may be advantageous to commence a new topic that had a logical development from a previous topic, from first principles or simpler material, geometry lends itself this approach. The general method of reducing learning difficulties related to content hierarchy is through revision, in order to ensure that salient features of previously encountered material required for an understanding of a new topic are fresh in the pupils mind. It is part of the professionalism of a good teacher of mathematics to have sufficient insight into both mathematics and thought process of children to know when the content hierarchy is to be respected and when it may be ignored or side stepped.

3.4 The logical nature of mathematics

Inability to carry through a logical argument is the cause of considerable learning difficulties in mathematics. The playing down of this skill in favor of instrumental application of rules even with pupil of limited mathematical ability is always bad practice. Pupils need to be encouraged to think about why in other circumstances it does not work. Sometime of course it is possible to arrive at a correct solution or a correct method of solving a problem by naive intuition rather than by logical reasoning which are for some people difficult to believe. e.g. ‘’there are no more even numbers than whole numbers’’? Is $^{n}/_{2} + n + 41$ a prime number? Can you proof your result? Given containers of same volume but of different shapes, ask the students to determine which one would hold the least liquid, which of the shapes come to mind first and why?

Logical thought needs to be given prominence in the school mathematics. The notion that problems need to be solved by intelligence thought other than rote methods, formal rules or random guesswork is not disputable.

3.5 Mathematical notation

Mathematical notation, which is central to the development of the subject, can cause considerable confusion in the minds of many people. This is partly due to the fact that notation makes mathematical visible, and various misconceptions arise from separation of this visible appearance from the underlying meaning. More precisely, students tend to attempt to attach meaning to notation solely on the basis of its visible appearance. Such as $3x - x = 3$. The best way out is to encourage the students to think about the underlying meaning of what they are doing. Teachers need to:

- Give precise meaning to mathematical symbols and notations
- Be aware of the problems caused by visual appearance
- Give purpose to the development of algebraic notation and computation

Examples of this include 2^2, 3^2, $(-2)^2$, -2^2

3.6 Formal algorithms

How important are algorithms to school mathematics (formal numerical computational procedures) this is a computation that can be carried out by a calculator and is distinguished from formal algebraic manipulation. Algorithms are superior in terms of time and effort compared to other methods but this needs to be demonstrated by the teacher. The students need to develop algorithms by themselves. Sometimes a teacher may require to derive some of these algorithms with maximum student participation. This is important if algorithms are to be utilized appropriately. The problem of algorithms is created in the manner of their presentation. Usually the teacher will persist only of its use and this determines the background cause of learning difficulties. At primary level mathematics, there is lack of separation between calculation algorithms and mathematical ideas, so that pupils come to think of algorithms as being the essence of mathematics. For real life use, it is better to encourage pupils ability to work intelligently with numbers such as being able to form a reasonable estimate of a numerical answer or being able to use a longer non algorithmic method which is understood than extensive algorithmic practice which may be forgotten after leaving school. Emphasis on algorithms in its final form plays down the essential reasoning quality in mathematics. And this interferes with reasoning.

3.7 Spatial concepts and geometric thinking

The study of geometry poses a number of difficulties for learners of a somewhat different nature from those of arithmetic and algebra due to its primary visual nature. While in arithmetic, written numerals merely represent numbers, the actual shape of the numeral bearing no relationship to the number, in geometry, a geometrical concept of say a triangle and its written form are essentially one and the same.

Consider an arbitrary triangle, once drawn its features become specific in shape, size and orientation and it no longer generalizes triangle in its form. Care needs to be taken to ensure that such accidental features of the particular configuration drawn are not thought by pupils to be part of the definition or idea. For example, students fail to see that squares are rectangles due to the unequal adjacent sides that are always drawn. The arms of an angle are not part of the definition of the size of an angle but, since longer arms increase the overall size of the angle configuration, it can easily be thought that, longer arms mean longer angles.

Since geometry is primarily a visual object, there is no way of avoiding this conflict between the particular and the general. The process of learning geometry requires the ability to distinguish the essential features which a particular configuration is drawn to illustrate from additional accidental and irrelevant features.

A second general difficulty that arises in dealing with spatial concepts and geometry is the relationship between visual experience and logical thought. Most students believe that

visual experience is proof as a result geometry level of an observational activity is reduced and this makes the appearance of geometrical shapes and figures the major determinant of their properties. A rectangle, which looks close to a square, will be given as a square while a chord drawn close to the diameter will be given as a diameter. The other aspect in geometry where visual sense is predominant is:

1) The perception of facts about a geometrical configuration as a result of identifying or isolating parts of the figure within a whole.
2) The representation, in plane, of three-dimensional objects. While visual aids are obviously important in three-dimensional work, the ability to translate from two to three dimensions and vice-versa is very important. Usually the two dimensional representation has an ambiguous visual appearance, being at one and the same time, interpretable both as a flat diagram and as solid object. Other difficulties occur for pupils, since angles which in the solid object are right angles may well appear in two dimensional diagram as non-right angles, and the effect of visual perspective will make some parallel lines appear to diverge.

In summary, difficulties in geometry can be reduced if:

- Geometric truths are distinguished from accidental/irrelevant features of particular diagrams
- Observation is distinguished from logical consequences
- Exact theoretical calculation is distinguished from practical measurement
- Reflective insight is made necessary to perceive implicit aspects of geometrical diagrams
- Three dimensional objects and their properties are made comprehensible through two dimensional representation. It is perhaps one of the touch stones of real ability in mathematics that a pupil can use algebraic methods with confidence in the establishment of geometrical results as such a view helps to provide pupils with a view of essential unity in mathematics.

4. Mathematics across the Curriculum

For many students, it is only in applications that mathematics acquires any real value. Feelings of anxiety, stress and fear of failure which students already have from their work in the mathematics classroom can be heightened. There are three main reasons for the difficulties pupils find in applying mathematics in other areas of the curriculum.

4.1 Mismatch of the syllabuses. A mathematical topic may be in another area of the curriculum, before it has been developed in the mathematical class, or in a form different from that in which it is learned in mathematics class, or in a form different from that in which it is learned in mathematics or without recent revision. For example the introduction of vectors using physics approach may have many account for the difficulties students encounter in this topic.

4.2 Attitudes of teachers of other subjects to mathematics. Teachers of other subjects may give impressions to pupils that they themselves regard mathematics as a necessary aid but not a subject which one need bother too much to understand.

4.3 Attitude of teachers of mathematics to other subjects. Teachers of mathematics may show no great interest in the way their subject is used in other areas of the curriculum, consequently they teach mathematics in a contextual vacuum. Many mathematics teachers show very much interest in mathematics related activities. Being seen by the students to involve oneself in the subject creates curiosity, an aspect we sincerely need if the attitude towards the subject is to be improved.

5. Conclusions

Difficulties with mathematics are pervasive and can have lifelong consequences. In today's schools, mathematics learning difficulties and disabilities often are not identified early enough. Early interventions can help all learners build the foundations they need to achieve in mathematics. The following strategies should assist the development of effective classroom methodology and to improve the overall quality of pupil learning.

5.1 Regular departmental meetings

Communication within a department is very important. This is done to ensure that all staff involved in teaching mathematics are properly informed about departmental organization and policy and have an opportunity to contribute to forward planning. The meetings play a central role in discussing and evaluating policy.

5.2 In-Service training

A program of in service training can be of considerable value. This can take many forms, besides district based in service, it may also be school based and is almost certain to increase the staffs awareness of learning activities.

5.3 Provision of learning resources

Suitable learning resources in the class room can be obtained in many ways. In addition to commercially produced material, and material prepared within the school, advice can often be obtained from other schools who are usually happy to recommend material which they have found successful and popular. However, it is necessary to develop criteria for suitability of resources. This will be discussed further in a different forum.

5.4 Support for individual

The provision of an organization, which facilitates effective individual support for pupils, should have a high priority irrespective of who the facilitator is.

5.5 Relationship of organization to aims

School and departmental organizations should be examined to ensure that it aids the achievement of well thought out teaching aims but does not indicate how the subject must be taught.

5.6 Responsible teaching

It is important for teachers to appreciate the mistakes made by students and to try and use their line of thought to support them in their effort to understand.

5.7 Effective record keeping

It is essential to have reliable knowledge of each pupils stage of mathematics development and of his current attainment. Allied to this there must be simple understandable method of recording pupil progress.

5.8 Relationship of content to pupil aptitude and ability

This is central to the whole teaching and learning process. There must be clear definition of the content to be taught, indicating priorities for pupils of various abilities and different stages of development.

5.9 Team /corporate teaching

There is urgent need for teachers of mathematics to corporate n the teaching of mathematics. One of the major problems that students have is personalizing subjects. Hey relate their learning to the subject teacher and not the subject content. To reduce this, team teaching and corporate teaching will be a practical solution. This area will be discussed under new trends in the teaching of mathematics.

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