Comparison of Senior Secondary Mathematics in Nigeria and China

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Abstract
Every developing nation all over the world aspires for scientific and technological advancement for national development. Evidences have shown that no nation can attain this scientific and technological development without high level of mathematical development. Unfortunately Nigerian students, especially at senior secondary level, have not been performing up to expectation in both international and continental mathematics competition. China has been showing superiority in mathematics over even the developed nations. The aim of this study was to compare senior secondary school mathematics in Nigeria and China with the aim of finding out what was wrong with our Senior Secondary Mathematics and proffer possible solutions. To do this, the structure of mathematics curriculum, the objectives and the curriculum contents in the two countries were compared. The methods of instruction and assessment were also compared. A qualitative approach was adopted in carrying out this study and data were obtained from documents and literature. The results of the study revealed that Nigerian curriculum is structured in thematic form where different schools use different textbooks while Chinese curriculum is structured in Modular form and all students learn the same thing at the same grade level. The Chinese senior secondary curriculum objectives were explicitly stated and the curriculum contents were up to international standard. The Nigerian senior secondary school mathematics curriculum contents were not up to the international standard in terms of coverage and depth. The findings also showed that there was strong collaboration among Chinese mathematics teachers in the planning and preparation of lessons and modern teaching methods were employed in the teaching of mathematics. In Nigeria, individualistic approach was used in the planning and preparation of mathematics lessons and most of the mathematics teachers employed teacher centred teaching methods in the teaching of mathematics. It was recommended that the Nigerian senior secondary school mathematics curriculum should be restructured in modular form and Government should provide fund for National Mathematical Centre, Abuja to produce the mathematics modules that have been prepared for primary and secondary schools. It was also recommended that the objectives of senior secondary mathematics in Nigeria should be revised and stated in a more explicit and unambiguous way and mathematics curriculum contents should be reviewed and upgraded to meet the international standards. Seminars/conferences should be regularly organised for mathematics teachers on collaborative teaching strategy and modern teaching methods.

Keywords: Student’s assessment, Curriculum contents, Objectives, Structure and teaching methods.
Introduction

Every developing nation all over the world aspires for scientific and technological advancement for national development. Evidences have shown that no nation can attain this scientific and technological development without high level of mathematical development. According to Aminu (1989) in Oyedeji (2011), the potential of a nation to develop science and technology is a direct function of its adaptation in the area of mathematics. Aguele and Usman (2007) noted that it is the level of mathematics that determines the level of the science and technological component of any nation. Hence the fact that mathematics is the cornerstone of scientific and technological development cannot be overemphasised. According to Okigbo and Nwoye (2012), the major problem of scientific and technological literacy in Nigeria today is how to teach mathematics, keep accurate records, and possess numerate skill. Unfortunately, students in senior secondary schools in most of these developing nations, Nigeria especially, have not been performing well in the international mathematics competitions.

Nigeria and China have been operating a similar system of education; nine years of Compulsory Basic Education and three years of Senior Secondary Education before a child can proceed to tertiary institution. In Nigeria it is termed 6-3-3-4 system of education. This means six years of Primary Education, three years of Junior Secondary Education and three years of Senior Secondary Education before a child can proceed to tertiary institution if so wish and is able to make necessary criteria for admission. The six years in Primary School plus three years in Junior Secondary make up the nine years Compulsory Basic Education.

The results of the International Mathematics Olympiad (IMO) competitions for senior Secondary School students have been showing a consistent good performance by Chinese Senior Secondary School students and the reverse is the case for Nigerian students. The table below is an extract from International Mathematics Olympiad results comparing the positions of Nigeria and China since Nigeria joined the competition in 2006 to 2015.

Table 1:

<table>
<thead>
<tr>
<th>Year</th>
<th>CHN</th>
<th>NGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2</td>
<td>88</td>
</tr>
<tr>
<td>2014</td>
<td>1</td>
<td>82</td>
</tr>
<tr>
<td>2013</td>
<td>1</td>
<td>84</td>
</tr>
<tr>
<td>2012</td>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>2011</td>
<td>1</td>
<td>78</td>
</tr>
<tr>
<td>2010</td>
<td>1</td>
<td>84</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
<td>90</td>
</tr>
<tr>
<td>2008</td>
<td>2</td>
<td>85</td>
</tr>
<tr>
<td>2007</td>
<td>1</td>
<td>84</td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 revealed that the best result Nigeria ever had was 67th position and that was in 2012 and Nigeria did not take part in the competition in 2008. The worst result China ever had was 2nd position since 2006 and that was in 2007, 2012 and 2015. The implication of these results is that China has been showing superiority in senior secondary mathematics over other nations, particularly Nigeria, in the international mathematics competitions. Even in the continental mathematics competition, Pan African Mathematics Olympiad (PAMO). Nigeria has not been performing up to expectation. The results in the official website of PAMO, (http://www.pamo-official.org/en/opam_resultats_pays.php?annee=2013&edition=22), revealed that the best result Nigeria ever had was 3rd position while countries like Tunisia, Cote d’Ivoire and South Africa had come first many times.

These poor performances in the international mathematics completions by Nigerian senior secondary students coupled with low pace of scientific and technological development have made the researcher to look inward to compare Senior secondary Mathematics in Nigeria with that of China with the aim of finding out what is wrong with our Senior Secondary Mathematics and proffer possible solutions.
Several studies have been carried out on comparison of mathematics curriculum. Ibrahim and Othman (2010) compared secondary mathematics curriculum between Malaysia and Singapore. The results of their study revealed that the Malaysian mathematics curriculum does not differ much from that of Singapore in terms of the topics covered. The significant difference is on the depth each topic is covered and the level at which the topic is introduced. Hodgen and Pepper (2010) examined mathematics education provision for 16-18/19 year-old (pre-university level) learners in 24 countries, including England, Scotland, Wales and Northern Ireland. They found that of the 24 countries included in the review, only six do not require compulsory participation in mathematics after the age of 16 and Mathematics is compulsory for all students in general education in 13 countries, and for all students in vocational education in nine countries. Their findings also revealed that England, Wales and Northern Ireland recorded lower levels of participation in upper secondary mathematics education than any other country surveyed and there is an option for extended study in further mathematics in most countries. Sugandi and Delice (2014) compared the secondary school mathematics curriculum of Turkey and Indonesia with respect to the paradigm embedded into them. One of the interesting findings was the disparity in the topics in different years of high school. There are some topics that are in Turkish mathematics curriculum but not in Indonesian mathematics curriculum and there are some topics that are in Indonesian mathematics curriculum but not in Turkish mathematics curriculum. The common topics and years are solely Analytic geometry, trigonometry and circle. Liu (2008) examined Some Aspects of Mathematics Teaching in Secondary Schools in China and England. The results revealed that the strategies of teaching mathematics in secondary schools in China and Britain are similar and both countries teachers emphasised the importance of the use of IT facilities in teaching and learning. However, English mathematics teachers experiences were more flourishing and Chinese mathematics teachers possible lacked enough technical support and appropriate facilities.

Research Questions

To carry out this study, the following research questions served as guides:

1) Are there differences in the structure of Nigerian senior secondary mathematics curriculum and that of the Chinese?
2) Are there differences in the objectives of Nigerian senior secondary curriculum and that of the Chinese?
3) Are modifications of Nigerian senior secondary mathematics curriculum contents needed to meet up with the international standard?
4) What is in the Chinese senior secondary mathematics curriculum that is not in Nigerian senior secondary mathematics curriculum?
5) Is it the method of teaching and assessment that make the difference?

Purpose of study

Poor performances of Nigerian students in international mathematics competitions at senior secondary level coupled with the slow pace in scientific and technological development in Nigeria have been the concerns of Nigerian Government, policy makers, educators as well as the researchers (for example Uwaifo and Uddin 2009, Ukah 2009, and Okonjo-Iweala 2012). The time has therefore come to examine the appropriateness of the senior secondary mathematics curriculum in Nigeria when compared with international standard. One meaningful way to do this is to compare the Nigerian senior secondary school mathematics to a developing country that has been consistently performing well in the international mathematics competitions at senior school level and is at fast pace in scientific and technological development. Senior secondary mathematics curriculum in China comprises of compulsory and optional studies. Every student is required to study the mathematics contents of the compulsory curriculum, which comprises of 5 modules. Similarly in Nigeria, senior secondary school mathematics comprises of General Mathematics and Further Mathematics. Every student is required to study the curriculum contents of General mathematics while further mathematics is optional.
The purpose of this study was, therefore, to compare the Nigeria senior secondary school mathematics and that of the Chinese. To do this, the structure of mathematics curriculum, the objectives and the curriculum contents in the two countries were compared. The methods of instruction and assessment were also compared. The study would focus on General mathematics and Compulsory mathematics in Nigeria and China respectively.

Significance of the study
This study is significant as the results were expected to expose the differences and similarities of the senior secondary mathematics between Nigeria and China. The results of the study would reveal the areas of Nigerian senior secondary mathematics that require modifications and reforms. The areas of teaching and students assessment that require improvement were expected to be revealed by the results of this study. The results of the study would shed light on why there were variances in Nigerian and Chinese students’ comparative achievement in international mathematics competitions.

Methodology
This study was a comparative analysis of the senior school mathematics in Nigeria and China. Specifically, the study compared the structure, objectives and contents of the senior school mathematics curriculum of the two countries. Methods of teaching and assessment of students were also compared. A qualitative approach was adopted in carrying out this study and data were obtained from documents and literature.

Data Presentation
Table 2:
Comparison of the structures of Genera/compulsory Mathematics Curriculum in Nigeria and China.

<table>
<thead>
<tr>
<th>Nigeria (General)</th>
<th>China (Compulsory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nigeria has national senior secondary school mathematics curriculum that was</td>
<td>• China has national senior secondary mathematics curriculum that was prepared</td>
</tr>
<tr>
<td>prepared by Nigerian Educational Research and Development Council (NERDC).</td>
<td>by the Ministry of Education.</td>
</tr>
<tr>
<td>• Nigerian senior secondary school mathematics comprises of General Mathematics</td>
<td>• China senior secondary school mathematics curriculum comprises of compulsory and</td>
</tr>
<tr>
<td>and Further mathematics.</td>
<td>optional studies.</td>
</tr>
<tr>
<td>• Every student is required to study the curriculum contents of General</td>
<td>• Compulsory curriculum consists of 5 modules, whereas there are 4 series in the</td>
</tr>
<tr>
<td>mathematics while further mathematics is optional.</td>
<td>optional curriculum.</td>
</tr>
<tr>
<td>• Nigerian curriculum is structured in thematic form.</td>
<td>• Each module carries 2 credits (36 hours of instruction).</td>
</tr>
<tr>
<td>• Further Mathematics is also structured in thematic form.</td>
<td>• Every student is required to study compulsory mathematics curriculum contents.</td>
</tr>
<tr>
<td>• Further Mathematics curriculum is meant to meet the need of potential</td>
<td>• Chinese curriculum is structured in Modular form.</td>
</tr>
<tr>
<td>mathematicians, Engineers and scientists.</td>
<td>• The optional curriculum comprises of 4 series that are structured in modules.</td>
</tr>
<tr>
<td></td>
<td>• Series 1 is meant for those students who wish to further themselves in the</td>
</tr>
<tr>
<td></td>
<td>humanities and social sciences, and series 2 is set up for those who wish to</td>
</tr>
<tr>
<td></td>
<td>develop themselves in science and technology, and economics while Series 3 and</td>
</tr>
<tr>
<td></td>
<td>series 4 are meant for those students who are interested in and</td>
</tr>
</tbody>
</table>

wish to elevate their levels of mathematical literacy.


Table 2 revealed that Nigeria has a national curriculum that was prepared by Nigerian Educational Research and Development council (NERDC) with the approval of Federal Ministry of Education. Similarly China uses a national curriculum where all teaching is controlled by the government. Senior secondary school mathematics in Nigeria comprises of General Mathematics and Further Mathematics. Every student is required to study the curriculum contents of General mathematics while further mathematics is optional. Similarly China senior secondary school mathematics curriculum comprises of compulsory and optional studies and every student is required to study the contents of the compulsory curriculum. Nigerian curriculum is structured in thematic form where different schools use different textbooks. These themes have topics spirally organized through the three-year of senior secondary education. Chinese curriculum is structured in Modular form and all of the textbooks are the same and all students learn the same thing at the same grade level. Further mathematics curriculum is structured in thematic form while Optional mathematics curriculum in China is structured in modular form. Further Mathematics curriculum is meant to meet the need of potential mathematicians, Engineers and scientists while in China the optional mathematics Series 1 is meant for those students who wish to further themselves in the humanities and social sciences, and series 2 is set up for those who wish to develop themselves in science and technology, and economics while Series 3 and series 4 are meant for those students who are interested in and wish to elevate their levels of mathematical literacy. Therefore the difference between the structure of Nigerian senior secondary mathematics curriculum and that of China is that Nigerian curriculum is structure in thematic form while that of China is structured in modular form. In Chinese optional mathematics, modules for each profession are specified while in Nigeria, there is no such specification. Modules are used in China while different schools use different textbooks at the same level in Nigeria.

Table 3:
Comparison of Objectives of Senior Secondary School Mathematics in Nigeria and China

<table>
<thead>
<tr>
<th>Nigeria</th>
<th>China</th>
</tr>
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<tbody>
<tr>
<td>The goal of senior secondary curriculum is to meet the Millennium Development Goals (MDG) and the critical targets of National Economic Empowerment Development Strategies (NEED), which can be summarised as: value-reorientation, poverty eradication, job creation, wealth generation and using education to empower the people. Specifically, the objectives of senior secondary mathematics are: 1) To provide necessary mathematical background for further education 2) To stimulate and encourage creativity 3) To develop the ability to recognize problems and to solve them with related mathematical knowledge 4) To develop precise, logical and abstract thinking 5) To develop computational skill</td>
<td>The overall goal of the Chinese Curriculum Standard is to further build the mathematical aptitude of secondary school graduates from the foundation achieved in the nine years of the compulsory curriculum, and also to meet the needs of individual and social development. Specifically to: 1) Foster basic knowledge and skills by teaching students basic concepts and conclusions, while also introducing the mathematical thinking and methodology to be applied in further study, and exploring the process of discovery and creation through self-study and research.</td>
</tr>
</tbody>
</table>
To generate interest in mathematics and to provide a solid foundation for everyday living.

To foster the desire and ability to be accurate to degree relevant to the problem at hand.

Enhance spatial imagination, abstraction, reasoning, computing and data processing skills.

Improve the ability to mathematically articulate, analyze and solve (simple practical) problems; promote mathematical expression and communication, and independent knowledge acquisition.

Encourage application and creation, mathematical thinking and judgment to real world models.

Foster interest and confidence in learning mathematics, and cultivate persistence and scientific thinking.

Develop an appreciation of mathematics in scientific, practical, cultural and aesthetic aspects; foster critical thinking and reasoning.

Establish a worldview of dialectical and historical materialism.

Source: Easyproject (2014).


Table 3 showed that the overall goal and objectives of senior secondary school mathematics in China are more explicit and focused than the objectives of senior secondary school mathematics in Nigeria. According to Quenbc.365, (2015), the goal of mathematics in China is to develop conceptual and procedural knowledge through rigor and rigour. Chinese senior secondary curriculum specifies detailed objectives for students (Tu and Shen 2010). Senior secondary curriculum and objectives of senior secondary school mathematics teachers in China can easily be prepared and delivered towards the achievement of the objectives. The overall goal and objectives of senior secondary school mathematics curriculum were ambiguously stated and they can hardly be incorporated into lessons to be delivered in the classroom by the mathematics teachers.

Table 4: Comparison of senior secondary mathematics curriculum contents in Nigeria and China.

Table 4:

<table>
<thead>
<tr>
<th>Nigeria</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall goal and objectives of senior secondary school mathematics curriculum were ambiguously stated and they can hardly be incorporated into lessons to be delivered in the classroom by the mathematics teachers.</td>
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</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Nigeria Content</th>
<th>China Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS I the themes are:</td>
<td></td>
</tr>
<tr>
<td>1) <strong>Number and Numeration</strong> (Number bases, Modular arithmetic, Indices and</td>
<td>Mathematics 1: (36 Hours, 2 Credits)</td>
</tr>
<tr>
<td>Logarithms and Set)</td>
<td>Set &amp; Function (13hrs), Basic elementary function I</td>
</tr>
<tr>
<td>2) <strong>Algebraic Process</strong> (Quadratic equation and Graphical representation of</td>
<td>(exponential function, logarithmic function, power function) (18hrs) and</td>
</tr>
<tr>
<td>Quadratic Equation)</td>
<td>Applications of functions (8hrs).</td>
</tr>
<tr>
<td>3) <strong>Geometry</strong> (Plane Geometry, Mensuration and Trigonometry).</td>
<td></td>
</tr>
<tr>
<td>4) <strong>Statistics</strong> (Data Presentation: Tally and Graphical representation of</td>
<td></td>
</tr>
<tr>
<td>Data).</td>
<td></td>
</tr>
<tr>
<td>SSII, the themes are:</td>
<td></td>
</tr>
<tr>
<td>1) <strong>Number and Numeration</strong> (Indices and Logarithms, Number approximation,</td>
<td>Mathematics 2: (36 Hours, 2 Credit)</td>
</tr>
<tr>
<td>Error Estimate and Progression Regression).</td>
<td>Spatial Geometry (8hrs), Positional Relations of points, Straight lines,</td>
</tr>
<tr>
<td>2) <strong>Algebraic Process</strong> (Quadratic Equation and Inequalities).</td>
<td>Plane (10hrs), Straight Line and its Equations (9hrs), Circle and its</td>
</tr>
<tr>
<td>3) <strong>Geometry</strong> (Plane Geometry and Trigonometry)</td>
<td>Equations (8hrs).</td>
</tr>
<tr>
<td>4) <strong>Statistics</strong> (Group data presentation, Measure of central tendency and</td>
<td></td>
</tr>
<tr>
<td>dispersion for group data and Probability).</td>
<td></td>
</tr>
<tr>
<td>SS III, the themes are:</td>
<td></td>
</tr>
<tr>
<td>1) <strong>Number and Numeration</strong> (Laws of Logarithms and application, Matrices,</td>
<td>Mathematics 3: (36 Hours, 2 Credits)</td>
</tr>
<tr>
<td>Number bases other than 10, Modular Arithmetic, Variation Surds and</td>
<td>Elementary Algorithms (12hrs), Statistics (16hrs) and Probability (8hrs).</td>
</tr>
<tr>
<td>Arithmetic of Finance)</td>
<td></td>
</tr>
<tr>
<td>2) <strong>Algebraic Process</strong> (Linear equations, Quadratic equation and application</td>
<td></td>
</tr>
<tr>
<td>and Algebraic fractions).</td>
<td></td>
</tr>
<tr>
<td>3) <strong>Geometry</strong> (Mensuration: Multiple dimensional objects, Trigonometry and</td>
<td></td>
</tr>
<tr>
<td>coordinate geometry).</td>
<td></td>
</tr>
<tr>
<td>4) <strong>Introductory Calculus</strong> (Differentiation of polynomials and Integration</td>
<td></td>
</tr>
<tr>
<td>of polynomials).</td>
<td></td>
</tr>
<tr>
<td><strong>Source</strong>: Federal Ministry of Education (NIG) 2007. Senior secondary</td>
<td></td>
</tr>
<tr>
<td>curriculum: Mathematics.</td>
<td></td>
</tr>
</tbody>
</table>

Box 1: Mathematics content for 3-year (compulsory) junior school.

**Algebra**: identities – Laws of indices, Laws of square root, Laws of Logarithms;
Equations and Inequalities – first degree, Quadratic, systems of equations (linear and quadratic); irrational and logarithmic;

**Sequences and Series**: Arithmetic and geometric;

**Geometry**: congruency and similarity, notable line and points of triangle, angles of triangle, relation between angle and sides, Pythagoras theorem; circle – Thales theorem, circumferential and centre angles, chord quadrangle, tangent quadrangle;

**Probability and Statistics**: (Wang, 2001)
Table 4 showed the General Mathematics curriculum contents in Nigeria and the Compulsory mathematics curriculum contents in China. In Nigeria, each year presents each concept at a different level whereas in China, each concept is presented in only one module except function that is presented in mathematics 1 and concluded in mathematics 4. In Chinese senior secondary mathematics curriculum, number of hours to be spent on each topic was specified to guide the teachers in the planning, preparation and delivery of lessons and credit units were attached to each module. In Nigeria, the number of hours to spend on each topic was not specified in the curriculum; hence different schools allotted different hours in their time tables.

There are some topics in Nigerian senior secondary school curriculum but they are not in the Chinese senior secondary school curriculum. The topics include Number bases, Modular Arithmetic, Indices, Logarithms, Linear and Quadratic Equations, Surds, Arithmetic and Geometric progressions and introductory calculus. A critical look at the Chinese junior secondary school curriculum, as shown in box 1, revealed that some of these topics that are not in the senior secondary school curriculum are already in the junior secondary school curriculum. Such topics include Indices, Logarithms, Surds, Quadratic equations and systems of equations and Arithmetic and geometric progressions. There are some topics that are in Chinese senior secondary school mathematics curriculum but they are not in Nigerian senior secondary school curriculum. They include Elementary functions and application of functions, Elementary algorithm, and Vectors. The depth of some topics that are common to the two curricula is not the same. For example geometry in China includes circle and its equations, Trigonometry includes trigonometric identities and Transformation formulae and Sequence includes deductive proofs. All these are not in Nigerian curriculum.

The implication of the above comparison of the senior secondary school curriculum contents of Nigeria and China is that the Nigerian senior secondary school curriculum standard is below Chinese curriculum standard.

Table 5: Comparison of the Teaching of Mathematics in Nigeria and China.

<table>
<thead>
<tr>
<th>NIGERIA</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the senior secondary school level, the bachelor of education degree or single subject bachelor’s degree plus a post graduate diploma in education is required for one to be a teacher however, holders of specialised qualifications like the national diplomas awarded by polytechnics can be employed to teach in secondary schools and technical colleges (UNESCO 2006).</td>
<td>To obtain qualifications for a teacher in a senior high school, one should be a graduate of a teachers college or a university with four years' schooling or upwards. (Xu and Kong, 2008)</td>
</tr>
<tr>
<td>Nigerian Mathematics curriculum pays particular attention to the achievement of the millennium development goals (MDGs) and the critical elements of the National Economic Empowerment and Development Strategies (NEEDS) (FME, 2007).</td>
<td>Teaching of mathematics in China is based on the Chinese &quot;Two Basics&quot;; basic knowledge and basic skills. The &quot;two basics&quot; teaching principle in mathematics aims to strengthen the basic knowledge and basic skills so as to lay a solid foundation for students’ further study and development (Tu and Shen 2010).</td>
</tr>
<tr>
<td>Different schools use different mathematics textbooks. However a number of these textbooks are not</td>
<td>In addition to the acquisition of basic mathematical knowledge and skills, students’ positive mathematical emotion, attitudes, and values are stressed as a main goal of mathematics teaching (Yang 2013).</td>
</tr>
<tr>
<td></td>
<td>China uses a national curriculum where all teaching is controlled by the government. All of the textbooks are the same and all students learn the same thing at the same grade level (Quenbc.356, 2015).</td>
</tr>
<tr>
<td></td>
<td>In China, the teaching objectives are divided explicitly into four operable levels: knowing, understanding, mastering, and agile application. The objectives are implemented through the</td>
</tr>
</tbody>
</table>
accompanied by Teachers guide. Hence different things are taught at the same level in different schools (Aina, 2006).

Most (mathematics) teachers in Nigerian secondary school system use the traditional or convectional method of teaching; lecture-based and teacher-centred instructional methods (Effandi and Zanaton 2006 and Azuka, 2013).

In both lecture- based instruction and teacher-centred instruction, the dominance of the teacher takes the stage while the students are the passive recipients of knowledge (Oyedeji and Egberha, 2011).

The teaching of mathematics in Nigeria is characterized by the traditional formul\-\-a-\-based approach with emphasis on computation and little reference to mathematical reasoning and problem solving. . No meaningful understanding of concept is taught and no emphasis on the connections between real-life problems and the mathematical concepts (NERDC 2013).

Individualistic approach is used by mathematics teachers in Nigerian secondary schools to prepare and plan for lessons. The lesson note is submitted to the subject supervisor who may not make any meaningful contribution to the lesson plan or the school principal who may not be a mathematician for approval.

Most of the public secondary schools in Nigeria close not later than 2.00pm; hence mathematics teachers in secondary schools use the time they should have used in teaching to mark homework and class work.

Most mathematics teachers in senior secondary schools do not use teaching aids to teach mathematics (Azuka, 2013 and Obei, 2014).

corresponding “actions” and exercises.

In China, student-centred method of teaching is applied in the teaching of mathematics at all levels in senior secondary schools. Students are engaged by calling individual student to demonstrate, in front of the class, answer or explain orally, seat work and group discussion (Lim, 2007).

Mathematics teachers frequently use active participation to check for individual understanding during a lesson, and integrate methods and real life projects in teaching mathematics.

Developing “new knowledge” from “prior knowledge” is a major method of teaching mathematics in Chinese classrooms.

Chinese Mathematics teachers lay emphasis on logical reasoning, mathematical thinking and proof during teaching.

There is strong collaborative culture among mathematics teachers. Teachers engage in continuous school-based collegial professional development through lesson study, and teaching research group (Lim, 2007).

The school mathematics Teaching Research Group or mathematics teachers of the same grade would prepare the lessons together and unify ideas for teaching. They collectively handle the objectives for understanding the mathematical objectives and the depth of explanation in teaching, as well as the selection of the corresponding examples and exercises (Lim, 2007).

In China, teachers often sit in on lessons given by other teachers and provide the teachers with comments after the class. Master teachers also give demonstration lessons to all of the mathematics teachers in a school.

Every week there is time for mathematics teachers to discuss teaching, either in a whole group or divided by grades. Common topics for discussion are reflections about lessons, getting help with trouble spots, making connections between content areas, getting across difficult points, analyzing student errors and solution methods, and sharing successful experiences.

Mathematics teachers in China spend about one-third of their time while in school on lesson planning and preparation, one-third of their time teaching, and one-third of their time engaged in discussions with other teachers (Tu and Shen 2010 & Lim, 2007).

There is always orderliness and serious discipline in Chinese mathematics classroom.
The indiscipline problem in schools is ranked as a major problem among students of secondary schools in Nigeria (Olaitan, Muhammed and Ajibola, 2013).

The rapport between teacher and students is close and affirming and mathematics teachers often used inspiring and encouraging words during their teaching. (Lim, 2007).

Use of ICT such as Power Point and Geometric Sketch Pad is integrated into the teaching of mathematics in China and the relevant units in the textbooks offer the related teaching websites.

Table 5 showed the academic qualifications to teach in Nigerian secondary school and that of Chinese are the same. Teaching of mathematics in Nigeria pays particular attention to the achievement of MDGs and the critical elements of the National Economic Empowerment and Development Strategies (NEEDS) while teaching of mathematics in China is based on the Chinese “two basics”: basic knowledge and basic skills. Different schools use different mathematics textbooks at the same level in Nigeria; hence different things are taught at the same level in different schools in Nigeria. In China all of the textbooks are the same at the same grade level of senior secondary and all students learn the same thing at the same grade level. Traditional or convectional method of teaching; lecture-based and teacher-centred instructional methods, where the dominance of the teacher takes the stage while the students are the passive recipients of knowledge, is used in most of Nigerian classroom. In China, student-centred method of teaching, where Mathematics teachers frequently use active participation to check for individual understanding during a lesson, and integrate methods and real life projects in teaching mathematics, is applied in the teaching of mathematics at all levels in senior secondary schools.

The teaching of mathematics in Nigeria is characterized by the traditional formula-based approach with emphasis on computation and little reference to mathematical reasoning and problem solving. In China, developing “new knowledge” from “prior knowledge” is a major method of teaching mathematics in Chinese classrooms and emphasis is laid on logical reasoning, mathematical thinking and proof during teaching. Individualistic approach is used by mathematics teachers in Nigerian secondary schools to prepare and plan for lessons while in China; there is strong collaborative culture among mathematics teachers. The school mathematics Teaching Research Group or mathematics teachers of the same grade would prepare the lessons together and unify ideas for teaching. Indiscipline problem in schools is ranked as a major problem among students of secondary schools in Nigeria but in China, there is always orderliness and serious discipline in Chinese mathematics classroom. Based on the comparison given above, it is obvious that the method of teaching mathematics in China is quite different from the method of teaching mathematics in Nigeria.

Table 6:
Comparison of methods of assessing students’ mathematics learning achievement in Nigeria and China.

<table>
<thead>
<tr>
<th>Nigeria</th>
<th>China</th>
</tr>
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<tbody>
<tr>
<td>Assessments in Nigerian Secondary schools are of three types; school-base assessment, assessment for certification and assessment for selection (Wilmot and Yakasai, 2006).</td>
<td>The main assessment types of Chinese mathematics education include school work-based assessment, selection-aimed, promotion assessment and competition-based assistant assessment.</td>
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<tr>
<td>School-based assessments include continuous assessment, terminal examinations and promotion examinations.</td>
<td>School work-based assessment includes routine assessment, period assessment and concluding assessment. These assessments mainly take the forms of closed book tests and closed book examinations.</td>
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<td>According to National Policy on Education.</td>
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Educational assessment and evaluation shall be liberalised by their being based in whole or in part on continuous assessment of the progress of individual (FRN, 2004).

In continuous assessment, students are expected to be assessed in the cognitive, affective and psychomotor domains, a number of times and at certain intervals using variety of techniques such as tests, projects, assignments, homework, class attendance, practical works, questionnaires, interviews, and sociometry.

School-based assessment, especially the continuous assessment, varies from teacher to teacher and from school to school; hence no uniformity in school-based assessment in Nigeria (Ayodele, 2013).

All levels of senior secondary in Nigeria take part in school-based assessment especially continuous assessment.

The scores obtained in the continuous assessment take some percentage of the end of the term or promotion scores while examinations take the remaining percentage.

During terminal and promotion examinations, teacher prepares questions based on what he/she has taught the students during the term or for the entire academic year in the case of promotion examination.

According to FRN (2004), the Senior School Certificate shall be based on continuous assessment and national examination.

Assessment for certification, known as Senior Secondary Certificate Examination, is conducted by West African Examination Councils (WAEC) and National Examination Council (NECO). This is to create the chance for the candidates to make a choice whether to sit for NECO’s version of the SSCE or the WAEC’s version (Dibu-Ojerinde, 2005).

Only the students at the terminal level (i.e SS3) take the Senior Secondary Certificate Examination.

Continuous assessment score is expected to take some percentage of each student score in the final grading.

Routine Assessment refers to the students’ every day homework.

Routine Assessment usually takes place in the same class or on the exact day of the new knowledge learning with the aim of evaluating the students’ mastery of the tasks, arousing their attention into the effects of studying, and helping the teachers to diagnose their own teaching gains and losses and the students’ difficulties in studying. Therefore, it is a typical formative school work-based assessment and it mainly takes the two forms of class work and homework.

The main materials of the class work are exercises in the textbook, exercises in the matched exercise book, and exercises made by the teachers themselves.

Homework is usually done after school and it has the following forms:
1. the students write their work in the exercise book;
2. the students fulfil the tasks by manual operation, such as small-scaled designs or activities;
3. the students carry out a simple research program using the mathematical methods to analyze and resolve the problems in the mathematical study and in ordinary life.

The materials of homework are the same as those of class work. They are mainly based on the study contents of that day and assist with some recent contents studied.

Period assessment is to evaluate students’ academic performance at the end of a teaching period; the main aim is to check whether the students accomplish the learning tasks during this period. It intends to not only help students focus attention on their own learning, but also to assist teachers in diagnosing the students’ learning difficulties and find out the merits and demerits of their teaching. In period assessment, closed book exams are usually in written form. The setting of the questions and the tests are organized by schools. There are three types of questions: multiple choice, blank-filling and solution-seeking questions.

A concluding assessment is mainly to assess students’ achievement. Exams are given to check the mastery of textbook knowledge and its application. Based on the scores of the exams, teachers grade students’ levels of accomplishment. The grades of the concluding assessments are recorded in the students’ achievement book. Closed book exams in written form are the only type of tests in a concluding assessment. Exams at the end of junior middle school (Graduation Examination of Junior Middle School) and senior middle school (Graduation Examination of Senior Middle School) are organized by the local administrative department of education. All the other tests of concluding assessment.
Assessment for selection is of two stages; Unified Tertiary Matriculation Examination (UTME) and Post UTME. Only the graduate of Senior Secondary School who have made at least credits in five (5) relevant subjects including Mathematics and English Language in Senior Secondary Certificate Examinations (SSCE) are qualified to take part in UTME. Those who can make the minimum cut off mark of the Tertiary Institution of their choice in addition to at least credits in the five relevant subjects will be qualified to write PUTME that will be conducted by the institution of the candidate’s choice.

The assessment types in Nigerian secondary school are school based assessment, assessment for certification and assessment for selection while the assessment types in China include school work-based assessment, selection-aimed, promotion assessment and competition-based assistant assessment. School-based assessments include continuous assessment, terminal examinations and promotion examinations but Chinese school work-based assessment includes routine assessment, period assessment and concluding assessment. In continuous assessment in Nigeria, cognitive, affective and psychomotor domains of learning are assessed through tests, projects, assignments, home work, class attendance practical works questionnaires, interviews and sociometry but in Chinese school work-based assessment, only the cognitive domain is assessed through closed book test and closed books examinations. There is no uniformity in school based assessment in Nigeria but in china the main materials of the class work are exercises in the textbook, exercises in the matched exercise book, and exercises made by the teachers themselves. In Nigeria, mathematics teachers administer test and class work to ascertain the students’ level of learning achievement on what the teacher has taught. Period assessment in China is to evaluate students’ academic performance at the end of a teaching period; the main aim is to check whether the students accomplish the learning tasks during this period.

In Nigeria, selection assessment in to higher education is of two stages; UTME and PUTME after obtaining at least five credits in five relevant subjects including mathematics and English language. Selection-aimed promotion assessment, which is meant for selecting students to go into a higher school in China, mainly contain the Senior Middle School Entrance Examination and College Entrance Examination: “The Mathematics Graduation Examination of the Ninth Grade” (or “Senior high school entrance examination”) and “College Entrance Examination”. The difference between the Nigeria methods of assessing senior secondary school students and that of China is the use of continuous assessment in Nigeria.

Discussion
Structure of Senior Secondary Mathematics curriculum in Nigeria and China
Table 2 revealed that the major difference between the structure of senior secondary mathematics in Nigeria and China is that in Nigeria the curriculum is structure in thematic form and different schools
use different textbooks while in China the curriculum is structure in modular form and all the schools use the same modules which are meant for their levels. Most textbooks used in Nigeria do not contain teacher’s guide, no unit objective and no teaching and learning/learning strategies. Modularised curriculum provides flexibility and choice that can enhance curriculum tailoring and cater for individual differences among students. It provides a frame work in which new skills and contexts can be introduced in a current way. A key organising principle of modular scheme, according to Muhammad (1992), is the explicit statement – for the teacher, student and parent. He stated further that Modular schemes allow flexibility in planning teaching teams. A module is a well structured or self-contained learning unit which is complete with specific objectives, contents, teaching/learning strategies and some forms of assessment. It clearly states its specific objectives in terms of concepts, skills and attitudes to be achieved, facilitating more successful experience in learning for the students (Robinson and Crittenden 1972 and Muhammad 1992). A module allows the learner to have a control over his/her learning and accepts greater responsibility over learning.

In modular instruction students are given complete freedom to learn when and how they want to learn; and the personal relationship between the teacher and the learner is motivating. According to Ausubel’s advance organizer model students acquire knowledge with the aid of a well-structured presentation; students learn new materials in terms of what they already know; and, advance organizers bridge the gap between what the student has learned and what he needs to learn and assimilate (Macarandang 2009).

Modules have been adjudged to be capable of enabling teachers handle teaching more effectively, also to be able to improve the performances of students in mathematics through improved strategies and also to arouse and sustain the interest of teachers and students in the teaching and learning of mathematics (NMC, 2003). Rodeiro and Nadals (2008) investigated the effects of modulisation and the results showed that Modular mathematics students perceived their modular exams to be quite valuable, and they were generally motivated to do well. The results also revealed that Modular mathematics students knew more about their end-year examinations and were more familiar with the requirements of their examinations than linear mathematics students. Greager and Murray (1991) enumerated the advantages offered to the teacher who uses the modular approach. These are: it provides the opportunity for organizing numerous sequences to reflect special interest of the teacher and students; it allows the teacher to focus on the deficiencies of students in the subject matter; it serves to eliminate the necessity of covering subject matter already known to students. With the use of modules, the progress of students is assessed and the routine aspect on instruction is reduced giving the teacher a chance to enjoy his/her personal contact with the students.

National Mathematical Centre, (NMC), Abuja, recognises the efficacy of modules in effective teaching and learning of mathematics in both primary and secondary schools and produced and perfected the use of modules. Due to the lack of fund, the centre could not mass-produce several copies for teachers and students use throughout the country (NMC, 2003). It is therefore imperative for the Government to make fund available for the mass-production of these modules in order to improve the teaching and learning of mathematics in Nigeria.

Objectives of Senior Secondary mathematics in Nigeria and China

Table 3 revealed that the objectives of senior secondary mathematics in China were more explicitly stated, more focused and mathematics teachers can easily prepare and deliver their lessons toward the achievement of the objectives. The objectives of senior secondary mathematics in Nigeria were ambiguous and can hardly be incorporated into classroom lesson plan.

The importance of explicit curriculum objectives cannot be over emphasised. According to Howell et al (2003), explicit objectives enhance quality instructions, increase students learning and improve assessment. Fortaine and Bernhard (1988) stated that explicit Objectives improve communication between the teacher and the students and between the teachers of a given syllabus, help in the choice of instructional and learning activities, facilitate the choice of educational material and provide a means of clarifying the purpose of evaluation. Curriculum objectives become usable educational tools
in so far as they are clear, precise, concrete and expressed both as teacher action and student learning. Formulation of explicit curriculum objectives helps teachers to take decision about the sequence in which material is presented. Without clearly formulated and precise objectives it is difficult to prepare valid test and other forms of assessment (Malcolm 1971).

Curriculum can be organized into three major components: objectives, content or subject matter, and learning experiences. Curriculum objectives act as a road map for the curriculum development and implementation process. They help direct the choice of curricular content and the assignment of relative priorities to various components of the curriculum and suggest what learning methods will be most effective and what evaluation methods are appropriate. If the objectives of mathematics curriculum are not explicit, precise, clear and concrete, the implementation of such curriculum in the classroom will be difficult for the teachers consequently the expected outcomes will not be achieved. Therefore the Nigerian senior secondary school mathematics curriculum objectives need to be review and stated in explicit and precise form that will help mathematics teachers in the effective implementation of the curriculum in the classroom.

**Senior Secondary Mathematics Curriculum contents in Nigeria and China.**

Table 4 and Box 1 revealed that some of the senior secondary school curriculum contents in Nigeria are in the junior secondary school curriculum contents in China. It was also revealed that some topics that are in Chinese senior secondary mathematics curriculum are not in Nigerian senior secondary mathematics curriculum. The topics that are common are treated more in-depth in China than in Nigeria. For instance, congruency and similarity, 2-D Geometry Equations and formulae, indices and logarithms are introduced in junior secondary schools and elementary functions, vectors and classical Euclidean Geometry and all these topics are treated to mathematical reasoning level. In Nigeria, the treatment of the senior secondary school mathematics curriculum contents does not go beyond problem solving level i.e. application. Mathematical reasoning and communication that are important part of higher level of cognition that can help Nigerian students to compete favourably with their international counterparts are not included in the treatment of the curriculum contents. According to Stabback, Male and Georgescu (2011), a good quality curriculum is comprised of content which is up-to-date, relevant, balanced, integrated and consistent with international norms and expectation. To ensure that a curriculum possess the quality stated above, they asserted that curriculum development should be seen as a cycle of development, implementation, evaluation and revision. Curriculum cannot afford to be static but rather it must be a continuing process of monitoring and checking, evaluating and updating, they concluded. It is therefore imperative for NERDC to revise the senior secondary school mathematics curriculum contents to meet the international standards.

**Methods of Teaching Mathematics in Nigeria and China**

In table 5, it was revealed that traditional or convectional method of teaching; lecture-based and teacher-centred instructional methods, where the dominance of the teacher takes the stage while the students are the passive recipients of knowledge, is used in most of Nigerian classroom and teaching of mathematics is characterized by the traditional formula-based approach with emphasis on computation and little reference to mathematical reasoning and problem solving. Different schools use different mathematics textbooks. Hence different things are taught at the same level in different schools in Nigeria. In China, student-centred method of teaching, where Mathematics teachers frequently use active participation to check for individual understanding during a lesson, and integrate methods and real life projects in teaching mathematics, is applied in the teaching of mathematics at all levels in senior secondary schools and there is strong collaborative culture among mathematics teachers.

Poor methods of teaching mathematics in Nigeria have been the concern of both educators and researchers. National Mathematics Council (NMC) (2003) reported that poor performances of students in promotion/public examinations in mathematics have more to do with the methods of teaching than the content of the subject. Kaka (2007) reported that teaching as being practiced today in mathematics using the lecture method has been found to be ineffective. The teachers do not give
learners the opportunity to think and contribute to the learning process. The method used in teaching by a teacher is very important as this affects the interest in the subject by the students. According to Emaikwu (2012) teaching method affects the response of students and determines whether they are interested, motivated and involved in a lesson in such a way as to engage in learning. In modern teaching approaches the most appropriate and more effective learning take place when students are in control and dominate the sessions in the teaching–learning process (NERDC 3013). Exchange of ideas between teachers and collaborations are vital in teaching and learning processes. Collaboration in school can help to institute team based and cooperate work structures in secondary school. Collaboration occurs when teachers share instructional strategies and techniques, make decisions about instructional issues and come up with ideas that enhance teaching and learning for all members of school communities (Oyedeji and Egberha, 2011).

The results in the table also revealed that both Nigeria and China require the same qualification for senior secondary school mathematics teachers and there is discipline in Chinese mathematics classroom. Evidences have shown that there is shortage of mathematics teachers in Nigerian senior secondary schools; hence they resort in using the teachers that are not qualified for the job. According to FME (2006), as reported in Thomas and Mbwas (2014), Nigeria had a total of 222,238 teachers. From this number, only 97,213(43.7%) were graduates with teaching qualifications, 45,172(20.3%) were graduates without teaching qualifications, 63,518(28.6%) were holders of Nigeria Certificate in Education (NCE), 10,620(4.8%) were diploma certificate holders and about 27% of the total teaching force were grade II, SSCE and other certificate holders. The report further revealed that Nigeria had a total of 14,942 secondary schools with 4,984,560 students. The Gross Intake Rates (GIR) for junior and senior secondary school students were 21% and 23% respectively. According to the analysis, out of the 14,942 secondary schools, 7,562(51%) were public schools, 3,624(24%) were private and 3,756(25%) were not public or private. From this information, it means that on the average there are approximately 334 students, 15 teachers, 6 graduate teachers with teaching qualifications and teacher/student ratio of 1:55 per secondary school. This means that the average number of qualified teachers in each secondary school is inadequate with a high teacher/student ratio and gross intake rates. Thomas and Mbwas (2014) also noted that the number of teachers with NCE certificates still teaching in the secondary schools is high. This is not normal as it is contrary to the required minimum teaching qualification in Nigeria he concluded.

The effects of shortage of qualified mathematics teachers in senior secondary school in Nigeria are not only felt in the international mathematics competitions but also in the national examinations. The report of the Chief Examiner (WAEC, 2009), according to Thomas and Mbwas (2014), clearly stated that students have shallow knowledge of mathematics, lack mathematical/manipulative skills and so on simply because they were exposed to poor teaching. The quality and quantity of mathematics teachers in the secondary school determines to a large extent how successful students learn, understand and perform in mathematics. This is because mathematics teachers that are qualified and employed in the right quantity are expected to teach effectively, leading to successful learning and improved performance on the part of the students.

Indiscipline among the secondary school students in Nigeria is another menace affecting students’ learning achievement in mathematics. Moye (2015) found that that there is high prevalence of indiscipline among secondary schools students which has significantly affected students’ interest in schooling and overall students’ academic performance in school. According to Adeyemo (2012), one major aspect of the classroom climate that has fallen under the control of the teacher is that of classroom management and discipline. Success (2011) noted that the problem of indiscipline is more apparent among secondary school students. He stated further that indiscipline among secondary school students ranges from truancy, negligence of duty, loitering absenteeism, shabby dressing, gangsterism embezzlement, sex scandals and so on.

These acts of indiscipline have been persistently interfering with teaching and learning of mathematics in Nigerian secondary schools. They have been making it difficult for both the students and their teachers to function effectively and efficiently. An effective teaching and learning is
achieved in any class where there is a well defined discipline (Gbologade, Waheed and Sangoniyi, 2013). Classrooms and schools with more disciplinary problems are less conducive to learning, since teachers have to spend more time creating an orderly environment before instruction can begin. Interruptions in the classroom disrupt students’ concentration on, and their engagement in, their lessons.

**Students’ Mathematics Assessment in Nigeria and China:**

In table 6, it was revealed that both Nigeria and China conduct internal and external assessment in senior secondary mathematics. In China both internal and external assessment are based on tests and examination. The implication of this is that only the cognitive domain of learning is assessed in China. In Nigeria, internal assessment is made up of continuous assessment and the end of the term examinations while external assessment is conducted by external bodies set up for the purpose. Continuous assessment is made up of class work, assignments, tests, projects, reports from excursion practical work and so on. The implication of this is that all the three domains of learning i.e. cognitive, affective and psychomotor domains are assessed in Nigerian secondary schools particularly in mathematics.

The introduction of continuous assessment, according to Obioma (1984), was to render assessment school based, improve evaluation of learners’ attainment by ensuring that assessment is cumulative, systematic, comprehensive and guidance oriented. Unfortunately, according to Bassey, Akpama, Ayang, and Iferi-Obeten (2013) continuous assessment has been subjected to a great deal of abuse and misinterpretations by teachers because most of them appear not to understand the rational for continuous assessment in the school system.

Some of the challenges facing continuous assessment include

- School teachers do not really understand the meaning of Continuous Assessment (Atsumbe and Raymond 2012).
- Secondary school teachers do not have the necessary basic knowledge and skill to construct good assessment instrument, administer and interpret the scores obtained from their assessment of the students (Marcus and Joseph 2014),
- Non-uniformity in the quality of assessments instruments (Ayodele 2013).
- Absence of adequate students record keeping and proper monitoring programme (Omebe 2014).

**Conclusion**

Based on the findings of this study, the following conclusions are arrived at:

- The modular structure of the Chinese mathematics curriculum and the use of modules to teach mathematics have been helping China to perform excellently in mathematics competitions.
- The Chinese mathematics objectives are explicitly stated and this has been helping the mathematics teachers in the classroom.
- Nigerian senior secondary mathematics objectives are ambiguously stated hence the mathematics teachers find it difficult to implement in the classroom.
- Nigerian senior secondary mathematics curriculum contents are not up to international standards in coverage and depth.
- Collaborative teaching strategy and use of student centred teaching methods is one of the secret behind the Chinese excellent performances in mathematics competitions at senior secondary school level.
- China assesses senior secondary school students at only cognitive domain of learning while Nigeria assesses the senior secondary school students at the three domains of learning, that is cognitive, affective and psychomotor domains.

**Recommendations**

The researcher considers it imperative to make the following recommendations for Nigeria senior secondary school mathematics curriculum to meet up with international standards.
The Nigerian senior secondary school mathematics curriculum should be restructured in modular form and Government should provide fund for National Mathematical Centre, Abuja to produce the mathematics modules that have been prepared for primary and secondary schools. This will help to eliminate the problem of the use of different textbooks in different schools at the same level.

The objectives of senior secondary mathematics in Nigeria should be revised and stated in a more explicit and unambiguous way so that the mathematics teachers will be able to implement them in the classroom.

It is imperative for the Nigerian senior secondary mathematics curriculum contents to be reviewed and upgraded to meet the international standards. Mathematics teachers should be trained and re-trained in order for them to be able to teach the upgraded curriculum contents.

Seminars/conferences should be regularly organised for mathematics teachers on collaborative teaching strategy and modern teaching methods. Mathematics teachers’ educators should emphasise the use of modern teaching methods during the training of the prospective mathematics teachers.

Continuous assessment has been adjudged as a good method of assessing students; hence seminars/conferences should be organised for mathematics teachers on how to tackle the challenges facing the implementation of continuous assessment.

References


International Mathematical Olympiad (IMO). Results: Ranking of countries • Cumulative results by year • Cumulative results by country; https://www.imo-official.org/results.aspx Retrieved on 10/12/2015.


Sugandi, B and Delice, A (2014). Comparison of Turkish and Indonesian Secondary Mathematics Curricula; Reflection of the Paradigms; Procedia - Social and Behavioral Sciences (152)7 pp 540–545.


Ukah, N (2009). Science, technology and Nigeria's development


hrd.apec.org/images/0/0f/44.7.pdf Retrieved on 24/9/2015.

Yang, Z (2012). Senior Secondary Mathematics Education in China;