

COMPARISON BETWEEN THE USE OF QUADRATIC FORMULA AND COMPLETING THE SQUARE METHODS IN SOLVING QUADRATIC EQUATIONS BY SENIOR SECONDARY STUDENTS.

By

OJO O. A.

*Department Of General Studies (maths),
Oyo State College Of Agriculture, Igboora.*

And

GBOLAGADE A. M.

*Department Of Mathematics, Emmanuel Alayande
College Of Education, Oyo.*

Abstract

The study examined the use of the "quadratic formula method" and "completing the square method" in solving quadratic equations on Senior Secondary students' Mathematics. It also determined the differential effects between boys and girls when solving quadratic equation by using the methods of quadratic formula and completing the square. Data were collected from 200 S.S.2 students using Quadratic Equation Mathematics Achievement Test (QEMAT). Two null hypotheses were generated for the study. Results from the study revealed that students taught with quadratic formula performed better than the students taught with completing the square method. Male students performed better than the female students in the use of quadratic formula and completing the square method. It is recommended that teacher should explain the concept of completing the square method better to the students rather than emphasizing only on the quadratic formula.

Introduction

Mathematics is an academic discipline which one cannot afford to neglect or avoid because it is the bedrock of Science and Technology without which there will

be no development. There is nothing we use on daily basis such as houses, automobiles, bicycles, furnitures, cell phones, computers and many others which does not demand a mathematical input. Even our economy, Our Democracy, National defence, Social Security, Disaster relief operation as well as political Campaigns and voting; all depend on mathematical models and quantitative habits of mind (Steen, 2010). Due to the nature of this subject therefore, it must be handled with care so that the foundation will not be faulty.

The ability to memorize difficult concept by rote learning was considered a way of exercising the mind and developing the muscles of the mind and brain. Child (1981) asserts that man is endowed with limited capacity for memorization. Based on this assertion, the task before a teacher is how to help students improve on their ability to assimilate information. We are all aware that Mathematics cannot be learnt by mere memorization through rote learning; it is also a known fact that, the ability to remember a concept effectively is when experiences are passed across to the learners through an appropriate explanatory method.

In fact, many teachers fail to explain key steps to be taken before arriving at the answers. To worsen matters, textbooks that teachers and students rely on to obtain good information on the subject do not adequately explain these steps. For instance, some secondary school Mathematics textbooks treat one or two examples on completing the square method but fail to logically lead readers to the general conclusion of what must be added to the two sides of the equation to make it a perfect square, instead the book concludes abruptly, in practice, the quantity to be added is the square of half the coefficient of x (or whatever letter is involved). Hence the students are forced to begin to adopt the steps by rote. This is not good to the average learner or the learner with disabilities.

It is important to realize that mathematics generally helps the individual and society to meet its goals by developing logical reasoning both inductively and deductively, Obodo (2004).

Logical reasoning is however good and better than cramming or rote learning. Hence Mathematics education avoids learning by rote but seeks to provide explanation for every process involved in solving a problem.

Purpose of the Study

The purpose of the study are multifaceted. The major was to compare the use of quadratic formula and completing the square methods in teaching quadratic

equations in Senior Secondary Schools.

Others include:

- ⇒ To find out if differences exist on students' performances when quadratic formula and completing the square method are used for solving quadratic equations.
- ⇒ To ascertain if differences exist on student performance between male and female students when quadratic formula and completing the square methods are used for solving quadratic equations.

Research Questions

The following research questions were formulated to guide the study:

1. What are the significant difference in achievement scores of students taught with **"quadratic formula method"** and those taught with **"completing the square method"** in the Quadratic Equation Mathematics Achievement Test (QEMAT)?.
2. What is the mean achievement scores of male and female students taught with **"quadratic formula method"** and those taught with **"completing the square method"**?

Research hypotheses

The following research hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the mean achievement scores of the student taught with quadratic formula method and those taught with completing the square method as measured by the QEMAT
2. There is no significant difference in the mean achievement scores of male and female students taught with **"quadratic formula"** and **"completing the square method"** by QEMAT
3. There is no significant difference in the mean achievement scores of male and female students taught with **"completing the square method"**.

Research Design

The study used two different experimental methods:

"Quadratic formula and completing the square methods". The researchers also administered the Quadratic Equation Mathematics Achievement Test for the two groups using the same quadratic equation questions.

Population, Sample and Sampling Technique

The study population comprises all Senior Secondary School in Surulere Local Government Education district of Oyo State. In this study, a sample of 200 Senior Secondary School class two (SS2) students were drawn randomly from five {5} Senior Secondary School in the study area. The names of these schools are Iresa-Adu Senior High School Iresa-Adu, Shepherd Academy, Iresa-Adu, Iregba Community High School, Iregba, Baptist Secondary Grammar School, Oko and Igbon / Gambari Community High School, Igbon. Forty (40) students were drawn from each of the five schools.

Experimental Procedure.

In each secondary school the students were divided into two equal groups. First group was taught on how to solve quadratic equation by the use of quadratic formula while the second group was taught on how to use completing the square method for solving quadratic equation. The teaching by the researchers lasted for two (2) weeks.

Validation of Instrument.

The QEMAT was validated by two experts in the Department of General Studies (Mathematics unit), Oyo State College of Agriculture, Igboora. Internal consistency was established for the two sections of the instrument by using Kuder - Richardson (K.R-20) formula for the objective section and the inter-rater reliability for the essay section.

Table 1. t-test table for hypothesis 1

GROUP		MEAN	STANDARD DEVIATION	d f	t-tab	t-cal	REMARK
Quadratic Formula Method Group	100	36.62	10.80	198	1.66	21.07	There is significant difference
Completing the Square Method Group	100	33.64	9.20				

