



**EFFECTIVE USE OF TEACHING AND LEARNING MATERIALS IN
MATHEMATICS IN THE BASIC SCHOOL IN THE CENTRAL REGION OF
GHANA**

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Abstract

The purpose of this study was to understand the effective ways of using Teaching Learning Materials (TLMs) in Mathematics at the Basic School Level in Ghana, especially in the Mathematics Classroom (Grade 1 – Grade 9). This study was based on facts and realities in some basic schools in the Central Region of Ghana: Teachers were the most targets. The research gathered data from Teachers in the Basic Schools in Abura Asebu Kwamankese, Awutu Senya, Cape Coast Metropolis, Twifo Herman Lower Denkyira and Komenda Edina Eguafo Abirem districts in Grades 1 – 9. In all, one Probability sampling (Simple random sampling) and two Non-probability sampling (convenient sampling and purposive sampling), Questionnaires were (closed-ended and partly closed-ended), Observation and Interview. Eighty-five (85) teachers were accessible for this study. Three research questions were targeted. In research question one, 35.3% of teachers believed that, TLMs should be used during the Delivery Stage of teaching and learning in the classroom since it will help students understand abstract ideas. In question two, Textbook was observed to be the predominantly used TLMs because it gives a balanced and chronological presentation of information. Finally, research question three observed that the stakeholder to provide TLM to be used in the classroom should be the teacher and the students and by improvisation. In the study, many teachers as indicated in the study are mathematically declined teachers in the Basic School in the Central Region of Ghana representing almost 16.47% of the

respondents. The district has long-serving teaching staff (many teachers have taught for 7 years and over in the study). TLMs are used mainly at the Introduction and Delivery stages in the teaching and learning process. Teachers improvised a lot to do their teaching but Textbooks tends to be the major used TLM in teaching and learning.

Keywords: Teaching and Learning Materials (TLMs), Instructional Materials, Lesson delivery, Introduction stage, Conclusion stage, Improvisation.

Subject classification codes: include these here if the journal requires them

Background of the study

Mathematics is the only subject that is seen and recognized as the mother of all learning with other subjects deriving their concepts from it (Anamuah-Mensah et al, 2014, Singha, Goswami & Bharali, 2012). In view of that teaching of it must be easy-going for students to produce wherever whenever (Wigley, 2008). To be easy-going, there must be relevant Teaching and Learning Materials (TLMs) to solve problems in Mathematics but otherwise (Nabie, Akayuure & Sofu, 2013). It is the outcry of stakeholders (Anku, 2016). Teachers prepare to “teach” but do not prepare students to “learn” (Abboa-Offei, 2005) thereby they present TLMs at any stage in the teaching and learning process (Mathematics Education in Ghana, 2014). Teachers rely solely on Textbooks for their teaching and learning.

Statement of the problem

To remediate this, teachers must use TLMs well to facilitate the teaching and learning in the classroom (Deku, 2013, Zyl, 2012, Adekeye, 2008 in Dorleku (2013), Chanda, Phiri & Nkosh, 2000). How effective do these facilitators of learning use them in the classroom? Therefore, the need to explore to identify the Effective ways of using TLMs; the stage in teaching appropriate for introducing TLMs; the predominantly used TLM and the stakeholder to provide them.

Research questions

The following research questions supported the study:

- What stage in the Mathematics teaching and learning process is appropriate for TLMs to be introduced to be used effectively?
- What TLM is predominantly used in the Mathematics lesson?
- Which stakeholder should provide TLMs for it to be used effectively in a Mathematics lesson?

Sub-research question

- Which TLMs must be used to teach some challenging topics in the Basic School Mathematics?

Methodology

Research design

Descriptive research design study

The study is based on facts and the realities (Leedy & Ormrod, 2007, Berg 2004).

Population

Teachers in the Basic Schools in Abura Asebu Kwamankese, Awutu Senya, Cape Coast Metropolis, Twifo Herman Lower Denkyira and Komenda Edina Eguafo Abirem districts in Grade 1 – Grade 9 in the Central Region of Ghana.

Target population

Table 1. Targeted population

• TARGETED POPULATION

School type	Category	Class selected	Total no. of pupils in each class	Total no. of teachers in the school	Head teachers in each school	Total
Public	Primary	Six	$8 \times 10 = 80$	$8 \times 6 = 48$	$8 \times 1 = 8$	136
	JHS	Form 2	$4 \times 10 = 40$	$4 \times 1 = 4$	$4 \times 1 = 4$	48
Private	Primary	Six	$8 \times 10 = 80$	$8 \times 6 = 48$	$8 \times 1 = 8$	136
	JHS	Form 2	$4 \times 10 = 40$	$4 \times 1 = 4$	$4 \times 1 = 4$	48
Total			240	104	24	368

Actual Population

Teachers in the Basic Schools in Abura Asebu Kwamankese, Awutu Senya, Cape Coast Metropolis, Twifo Herman Lower Denkyira and Komenda Edina Eguafo Abirem districts.

Accessible Population (85)

Probability value (p-value of 0.01).

Sample

Teachers from the accessible schools in the districts.

Sampling Procedure

One Probability sampling (Simple random sampling) and two Non-probability sampling (convenient sampling and purposive sampling).

Instrument

Questionnaires (closed-ended and partly closed-ended), Observation and Interview.

Instrument

Questionnaires were self-administered; rating was applied to avoid “straight-lining” and “item specific” type of questions. Observation was done by the researcher in School A in the Cape Coast Metropolis as a way of Pilot Study. Interview guide was since the respondents could create discussion and conversation.

Descriptive Statistics (frequency and percentage)

Demographic characteristics of respondents (Cross-tabulation). TTC = Teacher

Training College

Table 2. Demographic characteristics of respondents

Item	Male	Female	Frequency	Percentage (%)
Major subject area				
Mathematics	10	4	14	16.47%
English Language	18	27	45	52.94%
Integrated Science	2	2	4	4.71%
Others (3 items)	18	2	22	25.88%
TTC Attendance				
Yes	28	29	57	67.06%
No	20	8	28	32.94%
Number of years teaching				
1 – 3 years	20	8	28	32.94%
4 – 6 years	8	10	18	21.18%
≥ 7 years	20	19	39	45.88%
Total	48	37	85	100.00%

Research question 1

Table 3. Research question one

Statement	Frequency	Percent
TLMs should be used during Delivery stage	30	35.3%
TLMs should be used in Preliminary and Delivery stages	26	30.6%
TLMs should be used in Preliminary stage	18	21.2%
TLMs should be used during Preliminary, Delivery and Conclusion stages	13	15.3%
TLMs should be used in Delivery or Conclusion stages	12	14.1%
TLMs should be used Preliminary and Conclusion stages	8	9.4%
TLMs should be used in conclusion stage	6	7.1%
Total	113	100%

Table tabulated at dichotomy value of 1.

The research found out that TLMs are most effective when used in the Preliminary and Delivery stages of the teaching and learning process (Farr, 2010, Chanda et al, 2000). Students understand abstract ideas if provided with sufficient relevant materials (Ausubel, 1973).

Research question 2

Table 4. Research question 2

Material	Frequency	Percent
Textbooks	75	88.2%
Chalkboard	69	81.2%
cutout shapes	64	75.3%
Counters	61	71.8%
Drawing instruments	59	69.4%
Bottle tops	58	68.2%

N = 85 for each material

Textbook was observed to be predominantly used with. Textbooks give a balanced, chronological presentation of information (Frederick, 2005).

Stakeholder

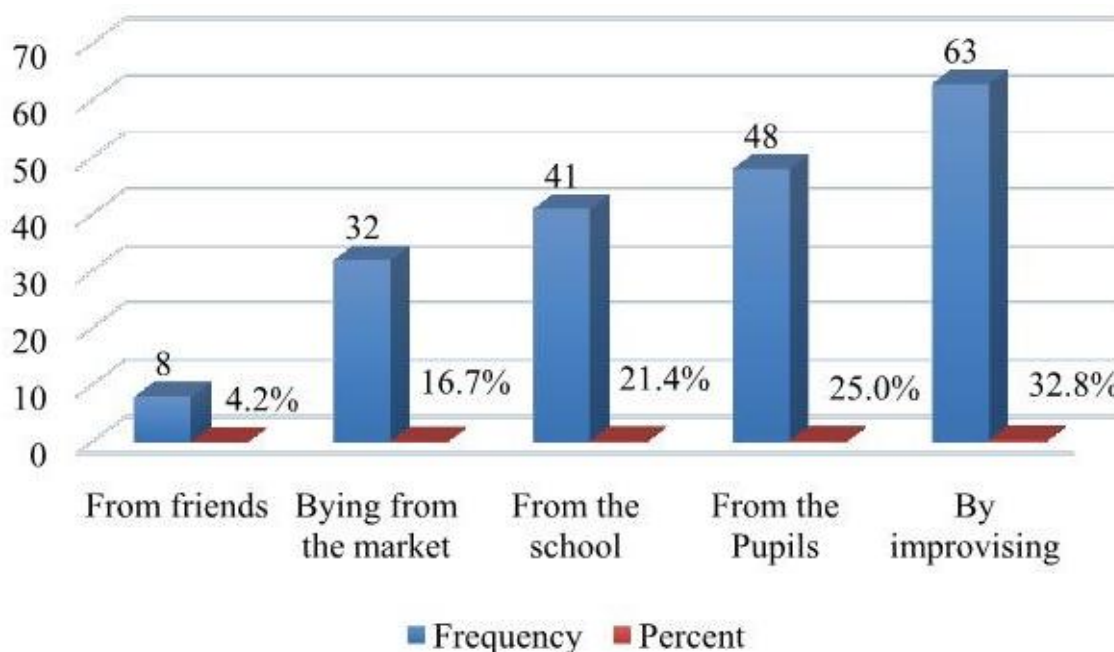


Figure 1. The Stakeholder who is responsible for providing Teaching and Learning Materials.

Stones were used as an improvised computer mouse (Osabutey, 2017, of Prime News Ghana and Ghana Web, 2017) which is in line with those revealed by the respondents in this study. TLMs can be made by the trainees and trainees (Chanda et al 2000). When

TLMs are provided adequately, teachers would not just be surveyors of information but facilitators of learning (Anamuah-Mensah et al 2014).

Summary

A total usable questionnaire of 85 was collected from teachers in some random selected districts in the Central Region of Ghana. From the data, cross tabulation, multiple analyses of frequencies and percentages were ran to obtain results for the study using the SPSS Statistical Software.

Findings/conclusion

Many teachers as indicated in the study are mathematically declined teachers in the Basic School in the Central Region of Ghana representing almost 38.3% of the respondents.

- The district has long-serving teaching staff (many teachers have taught for 7 years and over in the study).
- TLMs are used mainly at the Introduction and Delivery stages in the teaching and learning process.
- Teachers improvised a lot to do their teaching but Textbooks tends to be the major used TLM in teaching and learning.

Recommendations and suggestions

- MoE, GES should ensure mathematically inclined teachers are made to teach mathematics.
- Long-serving staff and experienced teachers must mentor the newly posted teachers and inexperienced.

- There should a course in the Education Institutions called “Teaching and Learning Materials” to make teachers in the making instrumentals.
- A body of experienced-Mathematics Educators is established to scrutinize Mathematics Textbooks before published.
- A study should be done using the Mixed method of study design to cross check if teachers in Mathematics and other subjects are actually using TLMs.

Reference

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