British Journal of Education
Vol.2,No.3, pp.22-36,July 2014
Published by European Centre for Research Training and Development UK (www.ea-journals.org)

THE USE OF MOTIVATIONAL TEACHING METHODS IN PRIMARY SCHOOLS MATHEMATICS IN ZIMBABWE: A CASE OF THE FIRST DECADE AFTER INDEPENDENCE

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ABSTRACT: *The purpose of this study was to investigate the application of motivational teaching methods in the teaching of mathematics in primary schools in Zimbabwe in the first decade after independence. Motivating students during their learning of mathematics has been viewed in literature as critical to successful learning of mathematics by students. Students find the learning of mathematics too abstract, mechanical and difficult (Mwamwenda, 1996). This problem has been compounded by teachers' obsession with teacher-centered methods like drill and practice which inhibit students to be creative and to demonstrate problem solving skills. While a great deal of research has been carried out on how to teach mathematics as well as on how to incorporate psychological principles of motivation into the teaching of mathematics, no research appears to have been conducted in the Zimbabwean context, to examine teacher use of motivational teaching methods in the teaching of primary school mathematics. This study therefore was an attempt at investigating how motivational teaching methods are applied during the teaching of primary school mathematics. It has been shown in literature and in this research that there are a number of motivational teaching methods which teachers can use to motivate their students to successfully learn mathematics. Among such teaching methods identified in this study include the learner-centered, group-collaborative, discovery, problem-solving and self-activity methods. The main finding of this study was that primary school teachers in Zimbabwean schools mostly use teacher-centered teaching methods rather than learner-centered teaching methods in their teaching of primary school mathematics and this is negatively impacting their ability to motivate students to effectively learn mathematics. A survey questionnaire was used as the main data collection instrument. Units of data were the primary school mathematics teachers teaching standard three up to standard seven classes*.

KEYWORDS: Motivational Teaching Methods, Primary Schools, Zimbabwe

INTRODUCTION AND BACKGROUND TO THE STUDY

Zimbabwe gained its independence in 1980. Immediately after independence, the need to refocus education to ensure it captured the aspirations of the majority in the new dispensation became overwhelming. Subjects such as mathematics, science and English became considered core subjects in Zimbabwean schools in a strategy meant to drive the whole transformation agenda not only of the education system but also of the national economy. This is confirmed by Jaji (1992) who posited that mathematics particularly became considered a very important subject for both the learner and the nation (Jaji, 1992). As a result of its noted importance, mathematics therefore has ever since been considered a compulsory subject from primary school to Ordinary level (form four level). However, despite the high regard given to the subject of mathematics at the very highest

level (government) the mechanical way the subject is being taught in primary schools is cause for concern. Teachers have been observed to mostly follow step- by- step methods suggested by textbooks instead of teaching mathematics in more creative ways. It is also important to note that the junior mathematics curriculum of the first decade of independence was developed in 1984 soon after independence. This timing meant that all materials, content and methodologies were to be in line with the new adopted dispensation of socialism according to the Secretary of Education (1987). To achieve this, curriculum planners produced materials which were highly prescriptive in order to influence the teacher towards teaching socialist ideals. From then on, this tendency seemed to have become endemic as teachers seemed and still seem to be conditioned to act more like technicians who follow certain prescribed methods of doing things without deviating from the norm.

Teaching materials and records show that it is not only teachers' resource books but also pupils' resource books that are highly prescriptive. Very little room is left for the teacher who is not creative to think of new approaches to teaching. Large classes also force teachers to be more concerned with the product than the process (Jaji, 1992; Isaacs, 1996). Such a situation leaves the teacher with very little time to research and develop innovative teaching methods. Teaching large classes as is the case in Zimbabwean primary schools where a class can have as many as 70 pupils can leave the teacher very exhausted and demotivated at the end of the day (Jaji, 1992). Despite these problems, research suggests that teachers can make the learning of mathematics meaningful, effective and interesting to the learners. Skemp (1987; 1989) opined that the major problem of learning mathematics by pupils is psychological. If teachers are able to incorporate psychological principles of motivation into their teaching of mathematics, learners may find learning mathematics more stimulating (Land, 1983).

Jaji (1992) also intimated that the basic foundation of the teaching of mathematics lies in the psychology of how children learn. The above assertion is also echoed by Hargreaves (1994) who argued that one major reason why teachers fail to effectively communicate mathematics to the learners was their failure to plan for motivational teaching methods in their teaching. In his discourse on the catalytic role played by motivation in teaching, Hargreaves (1994) argued that without the incorporation of motivational principles in teaching, meaningful learning of mathematics by pupils will become a pipe dream. In his research on motivational teaching, Konesappillai (1995) found that inability by teachers to use motivational techniques in the teaching of mathematics was a major reason why children dislike mathematics.

LITERATURE REVIEW

The concept of motivational teaching methods

A teaching method is a way in which a teacher organizes and manages the teaching-learning situation, presents clear explanations and vivid descriptions, assigns and checks if learning interacts effectively with learners through questions and probes, answers and reactions, and praise and criticism (Schulman, 1999). According to Carl (1995), a teaching method is a way of facilitating interaction between the teacher and learners in order to realize set goals. Learning that is motivating therefore should be:

- An active process in which the learner is maximally involved; and

- Guided through the use of a variety of teaching methods, which in the end offer learners a variety of learning experiences, that will enable them later to generalize and discriminate information (Carl, 1995).

In order to motivate learners Scot (1994) posited that learner- centered teaching methods should be used to ensure that:

- There is a close link between the learning needs of the learner and the teacher's teaching;
- Feedback is given in phases so that the learner feels that his/her hard work is being recognized and rewarded by the teacher;
- All learners are challenged and extended in their learning; and
- Whatever is being taught is directly linked to the learners' real life experiences.

Teaching methods can produce the desired goal of making students learn with understanding if a variety of teaching methods are used (Knoller, 1991). This is supported by Palmer (2005) who believed that use of a variety of teaching methods, especially constructivist ones, empowers learners with skills of independent thinking and problem-solving. By establishing every day teaching contexts for problem-solving, teachers can stimulate their learners to ask questions, gather information and evaluate their thoughts and answers. According to Palmer (2005), classroom practice is highly likely to be more effective when informed by an understanding of how students learn and this calls for teachers to have a working understanding of and ability to apply constructivist-informed teaching methods in classrooms. The above is also emphasised by Ritchie (1998) who posited that the use of constructivism as a referent for classroom practice is key to motivational teaching.

Research has shown that the cognitive constructivist approaches which arose from the ideas of cognitive psychologists such as Jean Piaget, are key to the development of cognitive processes within the learner (Piaget, 1978). These approaches afford the learner the opportunity to experiment and make sense of the world around him/her (von Glaserfeld, 1987). Since cognitive constructivism emphasises the personal construction of knowledge by the learner (Driver & Oldham, 1986), if teachers effectively play the role of guides in classrooms and let students do the actual learning themselves, they will be able to assist and also motivate their students to access their pre-existing knowledge and beliefs and link them to what they will be currently experiencing in the classroom, and even be able to modify them as they create new knowledge (Palmer, 2004; 2005; Driver & Oldham, 1986; Phillips, 1995; Roth, 1994; von Glaserfeld, 1987). According to Palmer (2005) the reconstruction of meaning and the construction of new knowledge require guided effort on the learner with the teacher acting as a source of guidance. Curzon (1990) also asserted that the idea of using teaching methods as a motivating tool in the teaching of mathematics, especially constructivist methods, develops in learners a sense of worth as well as confidence to undertake problem-solving tasks, not only in the mathematics classroom but in various life situations outside school. Such teaching methods include the didactic, discussion, group work, self-activity, experiential and discovery methods (Curzon, 1990).

Typology of motivational teaching methods

Didactic methods: In an attempt to create more motivating experiences for learners to actively learn mathematics under the guidance of the teacher, Moru (1995) suggests that teachers should vary learning activities by using didactic teaching. Didactic teaching has three forms; namely:

- exposition: the teacher simply presents the learning content verbally. This is important for the exposition phase of the teaching when the teacher wants to clarify mathematical concepts which are unfamiliar to learners;
- discussion: this is a continuous interaction between the teacher and learners (vertical interaction) and/or between the learners themselves (horizontal interaction) as they share ideas about a mathematical concept under consideration; and
- self-activity: each learner carries out an assigned activity with the teacher acting as a guide where needed. This involves the use of constructivist teaching methods, such as discovery, project, and problem solving.

Group work: Group work is two-way communication during when learners communicate amongst themselves in relation to the learning of mathematics. It is a teaching strategy that allows for horizontal learning as learners are given the opportunity to share ideas amongst themselves. Costello (1991) suggested the use of group work for horizontal learning. Such groups should be flexible to allow learners of different abilities and sexes to share ideas every time. Costello (1991) further draws our attention to the fact flexible grouping, also referred to as group dynamics is important for biosocial forms of motivation. Biosocial motivation which is also referred to as psychogenic motivation by Dennis (1993) is influenced by social motives. Such motives include the need for achievement, need for affiliation, and the need for dominance. Dennis (1993) posits that these motives are learned and culture-specific, and that a cocktail of well-planned and structured learner-centered teaching methods which allow learners to share information in groups are an important source of motivation. Methods like projects and field work are very important in allowing for group work and in satisfying learners' biosocial need for learning mathematics (Dennis, 1993). Brown and Palinsar in Resmick (1991) support group work by stating that group activity and collaborative work can help to motivate mathematics learners by allowing them to share the thinking load and to act as models for collective planning for the solving of given problems. Oliva (1992) suggested seven types of groups which teachers can use in their teaching of mathematics. These groups include the horse-shoe, round table, syndicate, buzz, brainstorming, nominal and fish bowl groups.

Self-activity: Self-activity allows for individual learning by learners while the teacher only offers guidance here and there. It encompasses the following teaching methods: project work, activity cards, learning contracts, self-study (home work), problem solving, programmed learning, field trips, and computer-assisted teaching (Oliva, 1992).

Experience-based learning: Experience-based learning allows for experiential learning or learning by actually doing. Teaching methods which fall under this category include simulation, dramatization, role play, socio-drama, laboratory training, and sensitivity training.

Discovery methods: Romiszowiski (1992) identified two major teaching methods that can make learning interesting, namely the discovery, and the reception methods. According to

Romiszowiski, the discovery method encompasses the following sub-methods which can be individually or collectively used to motivate learners to want to learn mathematics:

- impromptu discovery method;
- free exploratory discovery;
- guided discovery; and
- Programmed learning.

Impromptu discovery learning entails unplanned learning and occurs in every learning situation (Curzon, 1990). Learners are asked to discover facts that initially had not been planned for them to discover. Some idea just crops up and the teacher then asks the learners to try and discover facts surrounding that idea. The idea however has to be related to the concept under discussion.

Free exploratory discovery allows learners to choose methods or steps for solving given problems. This method is also known as the problem solving method. Curzon (1990) points out however, that the problem solving method should not only concentrate on classroom (book-related) tasks but should try and capture various mathematics problems occurring in real life situations.
Guided discovery according to Curzon (1990) requires that objectives are provided by the teacher for each learning stage. The learner is then free to explore different ways of solving given problems but with the guidance of the teacher at every necessary stage. Guidance can be through leading questions or comments.

Programmed / linear discovery learning leads the learner through a series of steps or procedures to discover new mathematics facts (Curzon, 1990). Topics especially in geometry, as in construction and methods of proof, can be carefully packaged into learning programmes to guide the student to discover new mathematical knowledge.

The reception method of learning: Reception learning includes the following modes of learning:

- inductive reasoning;
- deductive reasoning;
- impromptu reception.

Inductive reasoning does not require the learner to discover mathematical rules but that he/she understands mathematical arguments in terms of what they mean and is able to generalize that understanding from the particular to the general (Romiszowiski, 1992; Grows, 1992).

Deductive reasoning is learning where the learner does not end at understanding only but goes beyond to applying acquired knowledge in new situations. It is the application stage of learning where the learner attempts to solve new problems using previously acquired knowledge (Romiszowiski, 1992; Oliva, 1992). Impromptu reception learning is when facts, skills, and observations, originally unplanned, become the source of learning. Learners discover new knowledge about an impromptu idea, and try to gain an understanding of what this idea is all about.

Based on the literature review of motivational teaching methods above, a synthesis is given in table 1 below in the form of a framework which will form the basis of the questionnaire on teacher use of motivational teaching methods, in the questionnaire.

Categories of motivational teaching methods	Specific teaching methods
Discovery	**Field trips** **Guided discovery** **Impromptu discovery** **Free exploratory discovery** **Programmed learning**
Group collaborative work	**Brainstorming** **Round table discussion** **Horse shoe discussion** **Fish bowl discussion** **Task method**
Self-activity	**Project method** **Field trips** **Activity cards** **Self study** **Problem solving** **Task method** **Computer-assisted learning**
Problem solving	**Unguided discovery** **Project method** **Impromptu discovery**
Reception learning	**Inductive reasoning** **Deductive reasoning** **Impromptu reception**

Table 1: Motivational Teaching methods Framework (Oliva, 1992)

From the view of relevant literature, it is be summarised that motivation has a number of positive effects on the learning of mathematics. Firstly motivation arouses, sustains and energies learners' interest in mathematics learning. This means that motivation can be a very effective learning stimulant that helps learners to develop and sustain classroom behavior conducive to the effective learning of mathematics. Secondly, motivation assists in the directing of learning tasks. However, this requires that a teacher should first identify the learning needs of his/her learners and then use teaching techniques which are sensitive to those needs. Reviewed literature further showed that learning activities should be selected and directed with a view to satisfy learning needs which include the need to explore, to work in groups, and to experiment. The third effect of motivation on learning is the effective organization of activities (Davies in Curzon, 1990; Murphy, 1987; Murray, 1984).

Major categories of teaching methods which were reviewed which may motivate learners included the didactic, learner-centered, group-collaborative, self-activity, discovery and problem-solving methods. These teaching methods and strategies will form the basis for the development of the questionnaire for data collection.

METHODOLOGY

Research Design

A research design has been defined in different ways by different authorities. Among such definitions is that a research design is the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process (Polit & Beck, 1991; 1998; 2001). It is also defined as a as a blueprint or detailed plan of how a research is conducted starting from the formulation of the research questions and hypotheses to the reporting of research findings (Polit & Beck, 2001). A research design is also defined as a strategy or plan for conducting a research study to examine specific testable research questions of interest (Babbie, 2004).

This study employed a survey research design which is defined as a systematic research design for collecting data from a representative sample of individuals using instruments composed of either closed-ended and/or open-ended questions, observations and interviews (Babbie, 2004; Polit & Beck, 2001; Kerlinger, 1986). A survey research design is also defined as a technique for gathering statistical information about the attributes, attitudes or actions of a population by administering standardised questions to a sample of a population (Babbie, 2004). Babbie (2004) further say that survey research designs are designed to provide a snapshot of the current state of affairs and to discover facts about a population.

The first reason why the survey research design was selected for this study is that it has the following advantages over all other designs: it is able to show relationships among variables that can easily be quantified, it uses more reliable data collection tools, it is extremely quick and has low error rates, and it can be used for a one-time collection of vast amounts of data on a selected population (Brink & Wood, 1998), The other major reason why the survey research design was chosen for this study over the other research designs is that surveys are very effective in researches that have individuals as units of analysis especially where the measuring of attributes, attitudes or orientations of large populations is required (Babbie, 2004). In this study, the unit of analysis is the individual (primary school teacher teaching any of standard three up to standard seven mathematics) and the point of focus is the orientation (use of motivational strategies) of the teacher.

Pilot study

A pilot study was done with five teachers, each from standard three up to standard seven to ensure that the data collection instrument was suitable for the research and hence to ensure validity and reliability of results. According to Zikmund (2003) a pilot study is defined as collected data for a small-scale exploratory research project that uses sampling but does not apply rigorous standards. The above is confirmed by Cooper and Schindler (1998) who posited that the purpose of a pilot study as is to detect the weaknesses in the design and instrumentation of a research instrument and also to provide proxy data for sections of a probability sample. In order to ensure suitability of the research instruments, this research will conduct a pilot study.

Population and sampling

Population is the totality of all subjects that conform to a set of specifications, comprising the entire group of persons that is of interest to the researcher and to whom the research results can be

generalised (Polit & Hungler, 1991; 1999; Gay, 1987; Ary et al, 1972; Ary, 1996; Lincoln & Guba, 1985). A population consists of all the subjects you want to study (Uys & Basson, 1991). Sample is defined as a portion or a subset of the research population selected to participate in a study, representing the research population (Ary, 1996). A sample is also defined as a group of subjects for a study selected in such a way that the individuals represent the larger group from which they were selected (Ary et al, 1972; Gay, 1987; Ary, 1996, Polit et al, 2001).

Population

The research population for this study comprised all the teachers who satisfied the eligibility criteria that they teach primary school mathematics from standard three to standard seven in the district of Masvingo. Eligibility criteria specify the characteristics that people in the population must possess in order to be included in the study (Polit & Hungler 1999). The population for the research comprised 1200 teachers in Masvingo district.

Sampling

Probability sampling also known as simple random sampling was used to select respondents and participants to the questionnaire. According to Saunders et al (2003), probability sampling also known as simple random sampling is a method of selecting a subset of individuals (sample) from a large group (population) such that each individual has the same chance/probability of being selected at any stage during the sampling process. The population of the study comprised of 1200 primary school teachers in Masvingo District, Zimbabwe. Masvingo District is made up of both urban and peri-urban schools within a forty kilometer radius from Masvingo Town. The sample consisted of 150 teachers teaching from standard 3 to standard 7. Stratified sampling procedure was used to select the 150 teachers who participated in the study. As part of the selection process, firstly the population of 1200 teachers from the 40 schools in the district were first grouped into strata (different schools with their different teacher populations). Thereafter, simple random sampling technique was used to selected participants from each stratum (school). The selection of numbers of participants from each stratum was done proportionately so that each stratum came up with a subsample. The total of the subsamples made up the sample for the study. Simple random sample is defined as a group chosen from a population so that all members have an equal and independent chance of being selected and included in the sample (Ary, 1996; McMillan & Schumacher, 1993). All teachers used in this study are suitably qualified having undergone full teacher training and possessing at least a Certificate in Education (C.E.).

Data Collection

Data collection instruments refer to devices used to collect data such as questionnaires, tests, structured interview schedules and checklists (Gay, 1987; Polit & Hungler, 1999). Data collection instruments that were used in this study were the questionnaire and document analysis.

Questionnaire

A questionnaire according to Saunders et al (2003) is a method of collecting data that consists of a series of questions and other prompts for the purpose of gathering information from respondents. According to Johnson & Duberley (2000), a questionnaire is a structured technique for data collection that includes a series of questions, written or verbal, that a respondent answers. A questionnaire is also defined as a method of gathering information from respondents about

attitudes, knowledge, beliefs and feelings (Polit & Hungler, 1991; Brink and Wood, 1998; Ary, 1996; Polit & Hungler, 1999).

Units of data

The main units of data for this study were trained and qualified teachers teaching standards 3 to 7, in primary schools in Masvingo District, Zimbabwe.

Data analysis

Data obtained from the research were processed and analysed using the SPSS. The SPSS software package was used to assist in presenting data in percentages for analysis and discussion.

Results

This chapter presents and discusses data. Data from the questionnaire was captured using the SPSS software. For data on teacher use of motivational teaching methods, the following coding system was used: To a large extent (TLE) (5), most of the time (MOT) (4), to some extent (TSE) (3), seldom (S) (2), never (N) (1). For ease of analysis, TLE + MOT = MOT, S + N = S. All coded data was then presented using percentages for further analysis. Analysis of the findings was thematic with five broad themes namely: learner-centered, group-collaborative work, discovery, problem-solving, and self-activity motivational teaching methods.

Group-collaborative motivational teaching methods

Brainstorming

Only 26% of the teachers use the brainstorming method most of the time as a motivational method during the teaching of mathematics. 21% of the teachers use the method some of the time while 53% of the teachers do not use the method. These results confirm the fact that brainstorming is not a popular method in especially the primary schools as most of learners are too young to use it and also the teachers have little idea of how to effectively apply it as a motivational method during the teaching of mathematics.

Roundtable discussion

50% of the teachers use the roundtable motivational teaching method most of the time during their teaching of mathematics because mostly young children want to learn in groups sharing their experiences. 21% of the teachers use the method some of the times while 29% of the teachers do not use the method during their teaching of mathematics. These results therefore indicate that there is a fair understanding of the method by teachers hence its general wide use during the teaching of mathematics.

Horse-shoe discussion

37% of the teachers according to study results use the horse-shoe discussion method most of the time as a motivational teaching method during their teaching of mathematics while 37% use the method some of the time. 26% of the teachers do not use the method. This suggests that there is either a lack of knowledge of the method or that teachers find it difficult to failure to effectively apply owing to problems of traditional sitting arrangements in classrooms.

Field trips
16% of the teachers use the field trips method as a motivational method most of the time during their teaching of mathematics. 18% of the teachers use the method some of the time while 66% of the teachers do not use the method. These results indicate that teachers either have little knowledge of the method as a teaching tool or they fail to use it because of logistical reasons at their work places.

Fish bowl method
40% of the teachers use the fishbowl method as a motivational teaching method during their teaching of mathematics most of the time while 60% of the teachers use the method some of the time. These results show that this method is not widely used by teachers as a motivational tool which may suggest either a lack of knowledge by teachers of how the method is applied during the teaching of mathematics in primary schools.

Discovery motivational teaching methods

Free exploratory
Only 26% of the teachers use the free exploratory motivational method most of the time during their teaching of primary school mathematics while 44% of the teachers use the method some of the time. 30% of the teachers do not use the method. The narrow use of the method indicates either lack of knowledge of the method on the part of the teachers or a belief that the method might not be very applicable to primary school children.

Impromptu discovery
20% of the teachers use the impromptu discovery motivational method most of the time during the teaching of mathematics while 60% of the teachers use the method some of the tomes. 20% of the teachers do not use the method. Indications from these results are that teachers seem to lack knowledge of how this method of teaching is applied during the teaching of mathematics.

Reception learning methods

Inductive reasoning
27% of the teachers use the didactic motivational method most of the time during their teaching of mathematics while 23% use the method some of the time. 50% of the teachers do not use the method. These results show that teachers seem unable to apply this method most probably because they do not understand it.

Deductive reasoning
30% of the teachers use the method most of the time during their teaching of mathematics while 29% use the method some of the time. 41% of the teachers do not use the method. Since the method is more learner-centered than teacher-centered, it can be noticed that teachers mostly prefer not to use it most of the time as they prefer more of teacher-centered methods in the teaching of mathematics. One reason for this as indicated in the introduction could be the nature of class sizes which are too large to allow teachers to engage learner-centered methods during their teaching.

Impromptu reception
15% of the teachers use the method most of the time during their teaching of mathematics while 27% of the teachers use the method some of the times. 58% of the teachers do not use the method. These results show that teachers have difficulties applying this method during their teaching of mathematics.

Self-activity methods

Activity cards
76% of the teachers use the activity cards method most of the time during their teaching of mathematics while 24% of the teachers use the method some of the time. These results are indicative of the fact that teachers are knowledgeable of the method and also are able to apply this method very well in the primary schools.

Problem solving
30% of the teachers use the problem solving method most of the time during their teaching of mathematics while 30% use the method some of the times. 40% of the teachers do not use the method. These results therefore are suggestive of the fact that teachers seem to be finding it difficult to apply the method during their teaching of mathematics in primary school.

DISCUSSION AND CONCLUSIONS

On the question on whether primary school teachers use motivational teaching methods in their teaching of mathematics, this study made the following findings:

Very few of the teachers use learner-centered teaching methods during their teaching of mathematics. This is confirmed by results that showed that less than 30% of the teachers use learner-centered teaching methods in their teaching of mathematics. This could either be that the teachers do not have adequate knowledge of the methods or have problems applying the methods during their teaching of mathematics and confirms the assertion by Isaacs (1996) who posited that teachers seem to have a propensity to use teacher-centered as opposed to learner-centered methods. Use of teacher-centered methods go against best practices that show that learner-centered teaching methods which include guided discovery, unguided discovery, and project method, highly motivate learners during the learning of mathematics (Pintrich, 2000; Kaplan & Maehr, 1999; Urdan & Maehr, 1995). It has also been shown in research that teaching methods that allow learners to experience a sense of achievement, help to boost learners' motivation to learn mathematics (Mwamwenda, 1996; Dennis, 1993; Borich & Tombari, 1997; Middleton, 2004). Use of learner-centered teaching methods is also viewed as important (Dembo, 1994; Borich & Tombari, 1997) because it allows the learners to stretch their limits as they seek to understand why and how certain problems are solved. This is in line with the dictates of both the attribution and self-determination theories. Scott (1994) also supports the use of learner-centered teaching methods by arguing that these methods close the gap between the learning needs of the learner and the teacher's teaching, and also that such methods challenge and extend learners.

The study also showed that very few teachers apply the group collaborative teaching methods during their teaching of mathematics in primary schools. According to results of the study, less than 40% apply these methods during their teaching of mathematics. Again the reason could be that the methods are unfamiliar to the teachers. Group collaborative methods include brainstorming, roundtable, horse-shoe, fish-bowl and task methods. By not widely using these group-oriented methods, literature shows that teachers deny learners an important opportunity to share ideas (horizontal learning) (Costello, 1991). Group-oriented teaching methods allow for two-way communication between students in a group and also between student groups and the teacher (Costello, 1991). According to Dennis (1993) group work allows for biosocial or psychogenic motivation in which learners are motivated to learn mathematics by a desire for affiliation and also a desire for dominance.

Results of the study also showed that very few teachers use the discovery methods during their teaching of mathematics in primary schools as only around 30% of the primary school teachers indicated that they are using the methods in their teaching of mathematics most of the times. Also, very few of the teachers are use problem-solving teaching methods in their teaching of mathematics in primary schools. This is confirmed in the study as around 43% of the teachers indicated that they use the teaching methods in their teaching of mathematics. Problem solving methods include project method, unguided discovery and impromptu discovery methods. Literature shows that teachers can effectively use these methods as motivational tools if they are able, during their teaching, to satisfy the following three types of values that affect learners' motivation to learn, i.e., attainment value, utility value and intrinsic value (Wigfield & Ecless, 2000). Attainment value relates to the extent to which the given mathematical task relates to the learner's self-image, as learners who normally consider themselves good in mathematics would want to confirm this by learning the subject and pass it well. Teachers therefore need to create conditions for learners to be able to succeed (Kaplan & Maehr, 1999; Urdan & Maehr, 1995). Utility value refers to the perceived usefulness of the task and if teachers are able to set tasks that learners view as relevant, teachers will be able to effectively use the problem solving teaching methods to motivate learners to learn mathematics (Wigfield & Ecless, 2000). Intrinsic value refers to the inherent enjoyment learners feel after successfully participating in a task in which they were able to independently sole the problem (Wigfield & Ecless, 2000).

When compared to the application of all the other identified motivational teaching methods being used by primary school teachers to teach mathematics, this study has shown that the self-activity method is generally widely used. This is confirmed in this study as statistics shows that around 53% of the primary school teachers use the self-activity methods in their teaching of mathematics. Self-activity teaching methods mostly used include the following: activity cards, task method, self-study (homework) among others.

From the above discussion of the findings, it can therefore be concluded that teachers in Zimbabwean primary schools do not widely and regularly using motivational teaching methods in their teaching of mathematics. Results of this study show that teachers mostly prefer to use the following motivational teaching methods: task method, self-study (home work) which all come from the self-activity motivational strategy.

REFERENCES

Ary, D (1996) *Introduction to research in education. 5th edition.* Toronto: Harcourt Bruce College Publications.

Ary, D; Jacobs, L.C. and Razavieh, A (1972). *Introduction to Research in Education*. NewYork: Holt, Rinehart and Winston, Inc.

Babbie, E. (2001). *The Practice of Social Research: 9th Edition*. Belmont, CA: Wadsworth Thomson.

Borich, G.D Tombari, M.L. (1997). *Educational psychology: contemporary approach*. New York: Merrill Publications.

Brink, P. J. & Wood, M. J. (1998). *Advanced Design in Nursing Research, 2nd ed.* Thousand Oaks, CA: SAGE Publication, Inc.

Carl, A.E (1995) *Teacher empowerment through curriculum development: Theory into practice.* Kenwin:

Juta and Co.

Cooper, D.R. & Schindler, P.S. (1998). *Business research methods, 5th ed.* Irwin/McGraw-Hill.Costello, (1991) *Teaching and learning mathematics:* London: Routledge.

Curzon, L.B (1990) *Teaching in further education: An outline of principles and practices. 4th edition.* London: Redwood Books.

Dembo, M.H (1994) *Applying educational psychology. 5th edition.* London: Longman.

Dennis, C. (1993) *Psychology and the teacher. 5th edition.* London: Cassell.

Driver, R., & Oldham, V. (1986). A constructivist approach to curriculum development in science. *Studies in Science Education*, 13: 105–122.

Gay, L.R. (1987). *Educational Research: Competencies for Analysis and Application, 3rd ed.* Columbus, Ohio: Merrill Publishing Company.

Green, S. K. (2002). Using an expectancy-value approach to examine teachers' motivational strategies. *Teaching and Teacher Education*, 18: 989–1005.

Grows, D. (1992). Effective Mathematics Teaching. New Jersey: Lawrence Erlbaum Co.

Hargreaves, A. (1994) *Changing teachers, changing times.* London: Cassell.

Isaacs, R. (1996) *Mathematics recreations.* London: Penguin Co.

Jaji, G. *(1992). Psychology: The basic foundation of mathematics teaching.* Harare: University of Zimbabwe Press.

Kaplan, A., & Maehr, M. L. (1999). Enhancing the motivation of African American students: An achievement goal theory perspective. *The Journal of Negro Education*, 68: 23–42.

Keller, J.M (1987) Strategies for stimulating the motivation to learn. *Performance and Instruction, 26 (8): 1-7.*

Kerlinger, F. (1986). *Foundation of behavior research, 3rd ed*. New York: Dover.

Knoller, G.F. (1991). *Foundation of education.* London: MacMillan Co.

Konesapillai, K. (1995) Mathematics syllabus: Present and future. *Southern Africa Mathematical Sciences Association Conferences,* 28 August to 1 September, 1-5.

Land, F.W (1983) *New approaches to mathematics teaching.* London: MacMillian Co.

Lepper, M. R., & Hodell, M. (1989). Intrinsic motivation in the classroom. In C. Ames & R. Ames (Eds.), *Research on motivation in education*, 3: 73–105).

Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic Inquiry*. London: Sage.

McMillan, J.H. and Schumacher, S. (1993) *Research in education: A conceptual introduction.* New York: Harper Collins College.

Middleton, M. (2004). Motivating through challenge: Promoting a positive press for learning. In P. R.

Moru, E.K. (1995). *Developing the quality of pupil learning*. Southern Africa mathematical Sciences Association Conference. 28 August to 1 September, 540-550.

Murphy, L (1987) *Mathematical teaching.* Boston: Routledge.

Murray, B. (1984) *Mathematics and motivation.* Perth: Macmillan.

Mwamwenda, T.S. *(1996)Educational psychology: An African perspective. 3rd edition* Durban: Heinemann.

Oliva, P F (1992) *Developing the curriculum. 3rd ed.* New York: Harper Collins.

Palmer, D. H. (2004). Situational interest and the attitudes towards science of primary teacher education students. International Journal of Science Education, 26: 895–908.

Palmer, D. H. (2005). A Motivational View of Constructivist-informed Teaching. *International Journal of Science Education*, 27: 1853–1881.

Phillips, D. C. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24: 5–12.

Piaget, J. (1978). *The development of thought: Equilibration of cognitive structures*. Oxford, England: Blackwell.

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92: 544–555.

Polit, D.F. & Hungler, B.P. (1991). *Nursing research principles and methods, 4th ed*. Philadelphia: JB Lippincott.

Polit, D.F., Hungler, B.P. (1999) *Nursing Research: Principles and Methods,*6th ed. Philadelphia: J.B. Lippincott.

Polit, D.F., Beck, C.T., Hungler, B.P. (2001). *Essentials of Nursing Research: Methods, Appraisal, and Utilisation,* 5th ed. Philadelphia: Lippincott.

Resmick, B. (1991) *Knowing, learning and instructing,* London: Lawrence Erlbaum Publications.

Ritchie, S. M. (1998). The teacher's role in the transformation of students' understanding. *Research in Science Education*, 28: 169–185.

Romiszowiski, A.J (1992) *Designing instructional systems: Decision making in courseplanning and curriculum design.* London: Kogan Page.

Roth, W.-M. (1994). Experimenting in a constructivist high school physics laboratory. Journal of Research in Science Teaching, 31: 197–223.

Saunders, M, Lewis, P. and Thornhill, A. (2003), *Research Methods for Business Studies, 3d edn*. London: prentice Hall.

Scot, D (1994) *Accountability and control in educational settings.* London: Cassell. Schulman, L.S. (1999) Taking learning seriously. *Change,* 31(4): 116. Secretary for Education., *CDU report .1987:* Harare: Ministry of Education.

Skemp, R.R (1987) *Psychology of learning mathematics.* London: Penguin Books.

Urdan, T. C., & Maehr, M. L. (1995). Beyond a two-goal theory of motivation and achievement: A case for social goals. *Review of Educational Research*, 65: 213–245.

Von Glasersfeld, E. (1987). Learning as a constructive activity. In C. Janvier (Ed.), Problems of representation in the teaching and learning of mathematics. Hillsdale, NJ: Erlbaum.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Psychology,* 25: 68-81.
Zikmund, W.G. (2003). *Business research methods, 7th ed*. Fort Worth: Dryden.