

MOTIVATIONAL STRATEGIES IN THE TEACHING OF PRIMARY SCHOOL MATHEMATICS IN ZIMBABWE

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ABSTRACT: *This study explored the concept of motivational strategies and how it applies to the teaching of primary school mathematics. A number of motivational theories were discussed in the study with regards to how primary school learners can be motivated to want to learn mathematics and such theories included the goal theory, achievement theory, the competency theory, the self-efficacy theory and the general interest theory among others. A number of motivational strategies were also discussed and these included the following: conveying confidence, conveying high aspirations, giving comments, and valuing learners' tasks. The results of this study indicate that while most teachers concurred that it is important to motivate learners to learn mathematics through the use of motivational teaching strategies, the majority of the same teachers do not seem to be regularly using motivational strategies in the teaching of mathematics. This study also showed that two of the major reasons why primary school mathematics teachers do not regularly use motivational strategies in their teaching are high workloads and large class sizes in their schools. A structured questionnaire was used for data collection.*

KEYWORDS: Motivation, Motivational Strategies, Motivational Theories, Extrinsic Motivation, Intrinsic Motivation

INTRODUCTION AND BACKGROUND TO THE STUDY

According to Rosenberg (1980), effective teaching of mathematics should provide learners with its own special products and processes which include mathematical concepts, generalizations, different methods of proof, and problem solving. Rosenberg's assertion is extended by Land (1983) who argued that even non-mathematical people know that mathematics is important in everyday life. Skemp (1989) is also of the opinion 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. What baffled Land though was that despite this knowledge of the benefits of mathematics, people, learners in particular, continue to have a dislike of mathematics. 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 echoed by Hargreaves (1994) who argued that one major reason why teachers fail to effectively communicate what they are teaching was their inability to plan for motivational strategies in their teaching. Research has also shown that only a limited number of children become interested in mathematics in the first place and very few care to choose mathematics at higher levels of learning because they find the learning of mathematics too abstract and less stimulating (Murphy, 1987; Murray, 1984). Land

(1983) though put the blame for this scenario on the teachers whom he alleged presented mathematical concepts to students in ways that force students to regard mathematics as something alien, fearful and meaningless. Isaacs (1996) called this a cold way of teaching mathematics which in its quest to develop mathematical skills in students totally disregards the important aspect of presenting such concepts to students in an interesting and motivating way. Konesappillai (1995) found that inability by teachers to use motivational techniques in the teaching of mathematics was a major reason why children dislike mathematics.

Skemp (1987) was alarmed by the large number of intelligent children who seemed unable to do mathematics in schools. He felt that this was a strange contradiction because if a child had adequate intelligence, then why would he/she fail to learn mathematics. Isaacs (1996) believed that a problem of this kind arises as a result of the use of teaching strategies by teachers which are not sensitive to the needs of students. In his discourse on teaching mathematics and motivation, Land (1983) stated that mathematics learning could be made more interesting and meaningful to students if learning takes place in somewhat unusual, innovative ways which allow learners the opportunities to demonstrate their creativity in solving problems.

LITERATURE REVIEW

In this chapter, firstly the concept of motivation will be clarified. Different motivational strategies, constructs and teaching methods will also be discussed in terms of how primary school teachers can motivate their pupils.

The concept of motivation

Human motivation according to Rosenberg (1980) is a complex concept in terms of its structure, classification and hierarchical organization of motives. Rosenberg (1980) believes that it is difficult to define motivation precisely because of its dynamic nature. Motivation is viewed as dynamic because what motivates one person might not motivate the other, and also what motivates one person today may not motivate him/her at all or to the same degree the next day. Literature shows that there is much contestation on what really constitutes motivation (Palmer, 2004; Harter, 1980). While previous research tended to characterize motivation as being biologically driven in order to satisfy personal physiological needs (e.g., Maslow's conception), recent studies have shown that while biological needs play a role in motivation, much of what drives motivation to do or not do something comes from the need to feel effective and demonstrate mastery of the environment (Harter, 1981; 1982; Deci & Ryan, 1985; Weist et al, 1998; White, 1959). In his work on drivers of motivation, White (1959) challenged the traditional theories of motivation that posited that the basis of behavior is grounded on the desire to satisfy biological needs, by arguing that it is in fact curiosity and desire to explore that underly motivation to do something.

However, despite problems with a precise definition of motivation, a number of scholars have attempted to define motivation. According to Louw and Edwards (1997), motivation is something that initiates, sustains and directs thinking and behaviour. To Farrant (1991), motivation is that which causes us to act. Dennis (1993) defined motivation as the force which spurs us on to satisfy some need which can be internal or external. Dworetzky (1988) said motivation

is a word which comes from the Latin word *motivum* which refers to the reason something has moved. To Dworetzky, therefore, motivation refers to any state or condition that moves an organism to act. Mwamwenda (1996) expands the concept of motivation when he defines motivation as an energizer or a driving force, or an urge that causes an individual to want to engage in certain behaviour. Hayes (1994) states that motivation is a state of arousal while Borich and Tombari (1997) define motivation as any activity-inducing drive. Dembo (1994) referred to motivation as the desire to achieve a particular goal. All the above definitions therefore imply that motivation is therefore a force that drives a person to act or behave in a particular way.

Psychologists, including Skemp (1987), believe that motivation is mostly and purely psychological in nature and because of this, it can sustain performance. Skemp (1987) further stated that motivation can sustain the learning of mathematics if viewed in the context of a cycle which he called the motivational cycle. Using the above pictorial representation of the motivation cycle, Skemp (1987) draws our attention to the fact that effective motivation first and foremost, derives its roots from a felt need. Such a need could be internally or externally generated. A motivation - sensitive teacher would then create conditions that help learners to see the satisfaction of his/her felt need not only as a possibility but as a reality. If these conditions are established making the learner enthusiastic or more interested in his/her learning in order to ensure the satisfaction of his/her felt need, the enthusiasm or interest would constitute the drive. The drive would be the energizing force to enable the learner to work even harder to satisfy his/her need or goal. The goal is referred to by Skemp (1987) as the terminal point of behaviour, that is, the end result of all the effort the learner would have been putting into his/her learning as a result of a felt need. Once this need or goal is achieved the fourth and last stage of the motivational cycle, that is, the satiation stage, is reached. At this stage, there is a cessation of the drive activity due to the satisfaction the learner experiences as a result of the achievement of a set goal. The above is also extended by Krause, Bochner, & Duchesne, (2003) who posited that motivation involves the processes that energize, direct and sustain behaviour.

It can be thought of as an internal process that activates, guides and maintains behaviour overtime (Krause et al, 2003; Harter, 1982). According to Krause et al (2003) activation starts one off, gets him/her going, guidance determines what one does do, what choices one makes and what interests to pursue while maintenance ensures that this whatever task is being done continues over time. This why as one of its definitions, motivation is defined as the force that energizes and directs a behavior towards a goal (Baron, 1995; Schunk & Pajares, 2002). According to Tan et al (2003), when a person is energized to satisfy some need or desire, that person will engage in, or be attracted toward activities that are perceived as having the potential to meet this need or desire.

Krause et al (2003) identified four critical perspectives of motivation as the behavioural, cognitive, social learning and humanistic perspectives that help to demonstrate the multi-dimensionality of the concept of motivation. The above is confirmed by Pintrich & Schunk (1996) who posited that motivation for learning can follow either a behaviouralist perspective

which emphasises on the influence of environmental factors such as rewards, or a social cognitive perspective which emphasises on the influence of aspects of the classroom context such as teacher/pupil interaction, pupil/pupil interaction etc. These perspectives can be represented diagrammatically as shown in table 1. The behavioural perspective of motivation as propounded by Skinner focuses on achievement of on-task or desired behaviour through external rewards and reinforcement (Krause et al, 2003). The cognitive perspective as propounded by focuses on cognitive processes, emotions, achievements needs and beliefs about causes of success and failure (Krause et al, 2003). On the other hand, the social learning perspective of motivation as propounded by Bandura focuses on learning through observation of others and self-regulation leading to personal standard and a sense of self-efficacy while the humanistic perspective of motivation as propounded by Maslow focuses on satisfying basic needs and achieving self-actualisation (Krause et al, 2003).

Sergiovanni and Starrant (1993) attest to the fact that motivation is not only about assisting in the attainment of set goals but also about maintaining or sustaining effort, even well after accomplishment. This means that teachers should at the satiation point, try to find other teaching methods and techniques that can help sustain motivation in the learners. This may be necessary because learners have a tendency of resting on their laurels once they have attained their goals. This view is also supported by Hayes (1994) in his discussion of the Yerkes-Dodson law of arousal which states that arousal improves performance up to some point only, after which performance begins to fall.

The above figure indicates that if teachers are not attuned to include other motivational strategies in their teaching to sustain the level of interest of learners once they have reached satiation or optimal level, learners may rest on their laurels and their performance may make a free fall to irretrievable levels (Hayes, 1994). An effective and creative teacher should move in quickly to take advantage of learners' high motivation levels as evidenced by their improved levels of confidence and competency, to teach them even more challenging mathematics problems so that the motivational cycle is repeated . Thus, learners are continuously kept at psychological states of cognitive disequilibrium (Hayes, 1994). If learners are allowed to lose what they have gained, it may take them even longer to regain lost effort.

THEORIES OF MOTIVATION

Research has shown that there are basically two types of motivation, namely extrinsic and intrinsic motivation. Mwamwenda (1996) defined extrinsic motivation as motivation that results when somebody works hard because he/she wants to achieve something, for example a qualification, recognition, or receive praise. Mwamwenda defines intrinsic motivation as motivation that urges or drives a person to work hard because he/she is interested in the learning itself. Louw and Edwards (1997) defined extrinsic motivation as motivation that occurs when behaviour is motivated by factors like tangible rewards, meeting obligations, passing tests or the need to impress other people, while intrinsic motivation occurs when behaviour is motivated or stimulated by a spontaneous interest in, or love and enthusiasm for a task. Farrant (1991) defined extrinsic motivation as motivation that occurs when a person is forced by another person or by the situation to act in a particular way while Ryan & Deci (2000) define extrinsic motivation as a force that causes

the doing of something because it has a separable outcome. Farrant said that this externally imposed motivation includes fear and reward where a person is forced to work in order to avoid punishment, to get good marks, to obtain a certificate, or simply to be top of the class. While extrinsic motivation is widely used in classrooms, its effectiveness is questionable (Deci et al, 1999) as it was shown in their research that expected, tangible rewards as distinct from unexpected rewards or verbal praise have a strong negative influence on other types of motivation including intrinsic motivation. The two orientations of motivation namely intrinsic and extrinsic motivation that, as discussed above which stimulate or inhibit the desire to engage in behaviour (Krause et al, 2003; Goldberg, 1994).

Dembo (1994) further extended the idea of extrinsic motivation by saying that it is based on the resolution of two competing needs, that is, the need to achieve success versus the need to avoid failure. However, Farrant (1991) said that externally imposed motivation helps learners to do better if a good teacher-pupil relationship exists during lessons and also if rewards and punishment are made appropriate to the age and character of individual learners. This view is supported by Mwamwenda (1996) who posited that rewards as a form of reinforcement of behaviour can only be motivational if the following two conditions are satisfied:

-The given reward is related to the learner's chronological and cognitive maturity. Young children appreciate tangible rewards while older ones see non-tangible rewards like praise and recognition as more meaningful.

-Quick knowledge of results is provided especially when good results are seen as aligned to some reward. It will be more a case of wanting to get the resultant reward quickly than the need to see results of a piece of work.

Extrinsic motivation refers to rewards that are obtained not from the activity, but as a consequence of the activity (Morris & Maisto, 2002). Extrinsic motivation arises from the use of external rewards or bribes such as food, praise, free time, money or points toward an activity (Morris & Maisto, 2002), applies where the incentives are all external, in that they are separate from the individual and the task.

On the other hand, intrinsic motivation according to Morris & Maisto (2002) arises from internal factors, i.e., it is as a result of rewards provided by an activity itself. According to Krause et al (2003), intrinsic motivation arises from internal factors such as a child's natural feeling of curiosity, exigent, confidence and satisfaction when performing a task. The above is in line with the assertion by White (1959) who posited that intrinsic motivation is directly related to the task being performed where a person feels instinctive pleasure when he/she learns something new or succeeds in a challenging task. This is supported by Deci et al (2001) who argued that intrinsic motivation is more effective than extrinsic motivation in promoting learning and achievement because it creates feelings of confidence and mastery that self-reinforce. In their research on intrinsic motivation, Deci, Koestner & Ryan (1999) made the following observations about the relationship between intrinsic motivation and rewards:

- i. Rewards increased perceived self-determination and also their effect on intrinsic motivation depended on the performance requirements set.

- ii. Reward procedures that required higher task rather than lower task (simple and trivial tasks) performance conveyed a task's personal or social significance, and hence increased intrinsic motivation.

Intrinsic motivation can be enhanced in the classroom through the following means: providing challenge, curiosity, fantasy, and control (Lepper & Hodell, 1989; Stipek, 2002).

- i. *Challenge* refers to a moderate level of difficulty that will allow students to experience a sense of achievement, mastery and competence when they succeed (Stipek, 2002). The level of challenge needs to vary from students to student according to their abilities, for it to be effective as a motivational tool.
- ii. *Curiosity* refers to a feeling that is evoked by new, discrepant or unusual learner experiences, and when students have their curiosity aroused. In such a situation students become more interested in resolving the inconsistencies they may have observed (Stipek, 2002; Banet & Nunez, 1997; Nussbaum & Novick, 1982).
- iii. *Fantasies* refer to the creating of situations in the classroom that allow students to step out of real life and make comparisons with real life (Palmer, 2004).
- iv. *Control* refers to students' feelings of self-determination and autonomy which lead to motivated performance especially when students perceive themselves to be in control of their behaviour (Black & Deci, 2000; Ryan & Deci, 2000).

There are a number of motivational theories that help to confirm the importance of rewards in enthusing learners to like and want to learn mathematics. These theories include the drive, equity, and valency-instrumentality-expectance theories. According to Dennis (1993), the drive theory asserts that all human activity is induced by a system of drives which are mostly primary and include fear, money, praise, etc. Hayes (1994) called this theory the homeostatic theory in which drives are seen as a source of motivation that results from homeostatic disequilibrium. If, for example, the desire to receive praise becomes so high in a learner, this may create internal homeostatic disequilibrium which will need to be corrected. This view is highlighted by Hayes (1994) in his discussion of the drive-reduction theory which states that all motivation for learning is based on the need to reduce some kind of drive which could be primary or secondary.

The need theory postulates that needs which include desire for rewards, recognition, praise, etc, are powerful sources of motivation to learn. On the other hand, the equity theory asserts that all learning works on a system of reciprocation or symbiosis, that is, the teacher can maximally motivate learners by showing appreciation that matches learners' effort through a system of rewards. The valency-instrumentality-expectancy theory posits that people make choices to do or not to do something as a result of their perceived expectancy that certain rewards will follow if they behave in a certain way.

Other theories of motivation which literatures shows as key to effective learning of mathematics by students include the goal theory (Dembo, 1994; Schultz and Schultz, 1994; Middleton, 2004), competency theory (Mwamwenda, 1996), Achievement theory (Dennis, 1993; Mwamwenda, 1996; Schultz and Schultz, 1994), attribution theory (Borich and Tombari, 1997), self-

determination theory, Borich and Tombari, 1997) and the self-efficacy theory (Dembo, 1994; Borich and Tombari, 1997; Borich, 1988).

The goal theory

Literature shows that most of the work on student motivation has been informed by achievement goal theory (Ames, 1992; Pintrich, 2000; Urdan & Maehr, 1995). The goal theory is a cognitive theory premised on the understanding that goals motivate individual learners by providing them with information about their successes or failures (Dembo, 1994). Also referred to as the goal-setting theory (Schultz and Schultz, 1994), the goal theory posits that people's primary motivation in a work environment or situation is defined in terms of their desire to achieve a particular goal. This line of thinking is also supported by Middleton (2004) who draws our attention to the fact that people's actions are mostly motivated by their desire for success. The above arguments resonate with the assertion by Dembo (1994) who attested to the point that students in classrooms are motivated to participate in an activity by a desire to satisfy personal goals which include social goals (e.g., desire to gain approval or acceptance of peers), mastery goals (desire to learn and master new knowledge), and performance goals (desire to demonstrate one's ability to others by getting a good grade or getting a higher mark than peers). According to Dembo (1994), the ability of a goal to be motivating is dependent on the following conditions:

- Specificity: goal is specific and clear on what is to be achieved;
- Proximity: goal is short term; and
- Level of difficulty: goal is attainable.

Harackiewicz et al (2002) identified two broad categories of performance goals namely the performance-approach goals and the performance-avoidance goals. The performance-approach goals refer to a situation where students demonstrate positive ability in comparison with others and they are motivated by this positivity. Performance-avoidance goals refer to a situation that shows students focusing on putting in a minimum amount of effort in their work just to avoid looking incompetent to others.

The competence theory

Mwamwenda (1996) posits that the inherent desire by all people to want to perform competently or to gain mastery of their environment or over a body of knowledge or skills is a potent source of motivation to expend more effort in some work. In the context of mathematics, the theory according to Mwamwenda (1996) posits that learning tasks that enable learners to feel they have what it takes in terms of skill and knowledge to solve challenging problems are a source of motivation and also help to boost confidence in the learners.

The achievement theory

The achievement theory of motivation asserts that all human actions and thoughts are motivated by the desire to achieve (Dennis, 1993; Mwamwenda, 1996; Schultz and Schultz, 1994). This theory is viewed as working on the premise that every student's latent wish is to avoid failure and to fulfill his/her desire for achievement/success. Cautioning on the use of this theory as a tool of promoting student motivation, Schultz and Schultz (1994) say that the success of this theory depends on the satisfying of the following three conditions:

- Learners must assume responsibility for solving problems, i.e., for their learning.
- Learners must be offered opportunities to experiment and gain new insights into different mathematical concepts.
- Feedback and reinforcement should be continuously given.

The self-efficacy theory

The self-efficacy theory is a contemporary theory that posits that a student's judgement of his/her confidence and ability to achieve a particular task is a potent source of motivation to learn (Dembo, 1994; Wigfield & Eccles, 2000). This agreement is supported by Borich and Tombari (1997) who also asserted that the lower the confidence level to perform a task, the lower the motivation to achieve set goals and vice versa. Borich and Tombari (1997) further argued that the self-efficacy theory works on the premise that an individual's personal expectations, internal standards and sense of self concept can be tailor-made to be sources of motivation through the use of confidence boosting learning activities which enable the learner to experience success as often as possible. To extend further the above assertion, literature shows that a student's belief in his/her ability to perform a task effectively can be a big source of motivation (Bandura, 1981; 1982). The above is so because the concept of self-efficacy relates to a person's or student's belief that he/she can organise and execute tasks that even contain ambiguous, unpredictable and often stressful challenges (Bandura, 1981).

There are two dimensions of the self-efficacy theory that Bandura (1981) identified. These are the efficacy expectation and response-outcome expectation dimensions. According to Bandura (1981), the efficacy expectation dimension refers to the belief that a student can successfully perform a given action while the response-outcome expectation dimension refers to the belief that the performed action will be effective in allowing the desired outcome in a given task to be achieved. Since self-efficacy is situation or task-specific, a student may have a high self-efficacy for one task and a low self-efficacy for another (Bandura, 1981; 1997) even though self-efficacy has been proved to be positively correlated with effort and performance (Zusho et al, 2003).

There are four factors which a teacher can use to improve the self-efficacy of students in a mathematics classroom (Bandura, 1981; 1997) namely mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states.

- i. *Mastery experiences* are viewed as the most critical of all the factors and relate to previous authentic successes the learner had in dealing with a particular challenge (Bandura, 1982). For these experiences to positively impact the learner's motivation to learn, the mathematics teachers needs to ensure that the tasks they set are not only challenging but are also achievable to enable the learner to experience a sense of achievement as often as possible (Pajares, 2002).
- ii. *Vicarious experiences* refer to experiences in which the learner sees a behaviour modeled by another person as a source of inspiration. In such a situation, the learner will try to imitate that inspiring behaviour in the class (McCabe, 2003). An example in the classroom is when a learner is inspired by good performances of another student and wants to perform as well in future.
- iii. *Verbal persuasion* relates to the positive feeling a learner demonstrates on receiving positive feedback that they have performed a task successfully. According to McCabe (2003) praise if used for both effort and achievement can be a potent source of motivation for students

to learn mathematics.

- iv. *Physiological/affective states* refer to learners' responses to their own bodily stress levels (McCabe, 2003). Learners who regard their own fear and anxiety of mathematics as indicators of inability may allow these negative attitudes to reinforce until they become debilitating while on the other hand a learner who treat anxiety and fear as normal bodily responses to stress develops high self-efficacy than even highly competent learners in certain situations (McCabe, 2003; Udo et al, 2001). In order to reduce learner fear and anxiety and ensure learners remain focused and motivated, mathematics teachers need to create supportive and pleasant classroom atmospheres by being empathetic, smiling, using appropriate voice projection, frequently using students' names, using appropriate and reassuring facial gestures, and being generally attentive to students' learning needs (McCabe, 2003; Udo et al, 2001; Kamins & Dweck, 1999; Sutherland & Singh, 2004).

The expectancy value theory

Wigfield & Eccles (2000) posited that students' judgement and beliefs about their expectations of success and the potential relevance of the content to be learnt could cause serious challenges on the motivation of students to want to learn. In further articulating the relevance of the expectancy value theory, Wigfield & Eccles (2000) identified three types of values that affect students' motivation to learn as attainment value, utility value, and intrinsic value.

- i. *Attainment value* is the extent to which the task relates to the student's self-image. As an example, students who consider themselves good in mathematics would want to confirm this by learning the subject well and pass it.
- ii. *Utility value* refers to the perceived usefulness of the task, As an example, learning mathematics might help a student to enroll into a university or college computer programme.
- iii. *Intrinsic value* refers to the inherent enjoyment students feel by participating in a task. This feeling is closely related to the essence of the constructs of intrinsic motivation and interest.

Research has further shown that values are closely related to students' enrolment choices while expectations are also closely related to improved or decreased performance (Green, Debacker, Ravindram & Krows, 1999). Literature has also further shown that there are a number of task-value factors that potentially positively influence students' expectancy-value beliefs in a learning situation (Green, 2002; Zusho, Pintrich, 2000). Such factors according to Green (2002) include the following:

- i. The teacher providing the reason for the task;
- ii. The teacher emphasizing the usefulness and importance of the task;
- iii. The teacher emphasizing enjoyment that can be gained from the task;
- iv. The teacher offering choice (variety) within the task; and
- v. The teacher modeling enthusiasm for the task.

The general interest theory

According to Ainley, Hidi & Berndorff (2002), there are a number of studies that link student motivation to the construct of interest. Ainley et al, (2002) went even further to identify two types of interest as personal interest and situational interest. Personal interest refers to a student having a long-term preference for a particular topic or knowledge domain, for example when a student is motivated to participate in learning because of his/her personal interest in mathematics.

Situational interest refers to a student having a short-term interest that is aroused by aspects of a specific situation such as when an unexpected formula is used in mathematics to come out with a correct answer (Ainley et al, 2002). While personal interest has been viewed as more enduring in its ability to motivate students to want to learn, literature has shown that it is very difficult for teachers to take all students' personal interest into consideration when planning lessons (Chen, Darst & Pangrazi, 2001). On the other hand, while situational interest is short-term, Flowerday et al, (2004), demonstrated in their research that it has potential to increase both students' engagement levels and their use of deep learning strategies, and could even neutralize the negative effects of personal interest.

The attribution theory

According to Borich and Tombari (1997), the attribution theory is premised on the fact that people are motivated by the desire to understand why they succeed or fail. Borich and Tombari assert that the theory presumes that the achievement behaviour in people is based on the resolution of two competing needs, namely the need to achieve and the need to avoid failure. This is also confirmed by Dembo (1994).

The self-determination theory

Borich and Tombari (1997) assert that an attitude of not giving up is the foundation on which motivated behaviour is built. According to Borich and Tombari, this theory does not only focus on determination in order to succeed but also focuses on three important signals of success namely competence, relationship (being able to relate well/ interact with others), and autonomy (being able to think and act independently).

MOTIVATIONAL STRATEGIES

Green's motivational strategies

Green (2002) explains strategies for motivating learners to want and like to learn mathematics by using the expectancy-value theory. Green et al (1999) assume that academic lessons in classrooms have both a social and an academic text. The academic text consists of the structure and content of the lesson while the social text conveys what learners regard as important to do and to learn. Teachers' contribution to learning needs to go beyond specific academic content. The expectancy-value theory according to Brophy in Green (2002) states that the amount of effort that learners are willing to expend on a task is a product of (a) the degree to which they expect to succeed at the task; and (b) the degree to which they value the task, and also value success on the task.

Wigfield and Eccles (1992) cited in Green (2002) examined expectancies and values of learners as well as their relationships and fluctuations over time. They found that teachers influence learners' motivation to learn through provision of experiences and communication of beliefs and expectancies. For example, the value that learners attached to both English and Mathematics correlated with their past degree of task success in those subjects. Green (2002) noted that the nature of individual learner-teacher interactions in classrooms has an impact on learners' expectancies about their future success. Based on the expectancy-value theory a number of motivational strategies have been identified that can be used to increase learners' expectancies for

success as well as to promote their valuing of learning tasks (Green, 2002). These strategies include the following major categories: conveying confidence, conveying high aspirations, giving comments, and valuing learners' tasks.

Conveying confidence

Conveying confidence in learners' abilities entails having a belief that all learners will succeed in a given task. This suggests that teachers use comments like, "It will be hard, but I know you all can do it," to motivate learners to strive for success. The above is confirmed by the self-efficacy theory. The self-efficacy theory (Dembo 1994) postulates that one's judgement of one's confidence and ability to achieve a particular task is a potent source of motivation as it helps to boost one's sense of worth. The lower the level of confidence, the lower the level of motivation to achieve given or set tasks, and vice-versa. Borich and Tombari (1997) believe that this theory is based on the premise that an individual's personal expectations, internal standards and self-concept can be tailor-made to be a source of motivation to learn. Confidence can also be built if the teacher creates conditions that enable learners, even at a very low level, to experience success as often as possible.

Conveying high aspirations

Challenging all learners in a class to do well and surpass their previous achievements is an important motivational strategy (Green, 2002). A statement like, "Can somebody tell me another way to solve the above problem?" may serve as a way to make learners become more creative in their solving of problems. Setting a goal towards which one may aspire is an important motivational tool in the learning of mathematics (Dembo, 1994). Setting high aspirations (Dembo, 1994) in the form of goals may motivate individuals if they are provided with information about their success or failure.

Commenting to the whole class or to individuals

Green (2002) believes that comments are very important for confirming expectations met or simply for confirming admiration for the accomplishment of a task by the whole class or by an individual. Comments such as, "What a bright class!" Or, "Almost all of you got the answer." Or, "This is good work, Susan," are very important for motivating students to improve their performance. Comments should be spread across the whole lesson for them to have an all-round appealing effect on the students. This implies that lessons should include introductory, process, and concluding comments, as illustrated below.

Introductory motivational comments: To enthuse learners to want to learn right from the outset, Green (2002) states that comments like the following can be used in lesson introductions: "Fractions is one of my favourite topics in Math," when the teacher is introducing the topic "fractions." This is called teacher modeling of enjoyment. To show the usefulness of a topic, the teacher can use a comment such as, "If you are dividing something between you and a friend, you use fractions"; or "If you are baking, you use fractions when measuring quantities of ingredients."

Process-related motivational comments: While it has been observed that teachers, in general,

favour this phase of teaching, research according to Green (2002) has shown that most of the comments given are just matter-of-fact, or general comments which do not really inspire improved performance by learners. Green therefore proposes simple yet effective process-related teacher comments such as "I am impressed with the work that I see", Or "I like the way you are solving the word problems", Or "You guys are good at this, even the hard ones."

Outcome-related motivational comments: It is very important for the teacher to give confirmation of good work learners have done during the introductory and process phases of a teaching episode by giving inspiring comments that will help to guide learners. The outcome or concluding phase of a lesson acts as a summary of work done and hence teachers should use encouraging comments during this phase such as, "Everybody did a wonderful job today", Or "There was a lot of creativity today in the way you solved the given problems"; Or "Some of you still need to look at word problems and practice solving them further".

Valuing of tasks

Within the expectancy-value theory further strategies can be identified to promote learners' valuing of tasks. These strategies according to Green (2002) include the teacher emphasizing the usefulness of a task, importance of a task, enjoyment during the task, offering of rewards, modeling of enjoyment, connecting tasks, mentioning the rationale, and offering choice.

Emphasizing the usefulness of a task: The teacher can use comments such as, "This will help you when you have to write your algebra test", Or "This will help you when you want to pursue a career in accounts".

Emphasizing the importance of a task: The teacher can emphasize the importance of a task according to Green (2002) by using comments such as, "You will be doing this all the time next year in your next grade", Or "You need to understand this task because further mathematics you will learn will depend on this task."

Emphasizing enjoyment: Interesting lessons may stimulate learners to want to learn even more, especially if the learning offers further opportunities for success. According to Green (2002) a teacher can allow for learner enjoyment during tasks through comments such as "Solving quadratic equations is a lot of fun"; Or, "Last year's class loved using games to solve these problems."

Offering rewards: Offering of rewards is a very important strategy of motivating learners and forms one of the tool kits of the valency-expectancy theory. Green (2002) believes that rewards can be offered for growth, excellence, or for completion of tasks. The rewards can only be meaningful as motivational tools if it is made clear before the task whether rewards will be token rewards, or will result in promotion to another group or grade (Green, 2002). Use of praise and rewards is an important motivational tool is supported by the Skinnerian school of thought as the essence of extrinsic motivation. The

behaviourist school of thought asserts that only when external conditions which include rewards and punishment are in place, will a pupil respond favourably. Skinnerians believe that learners can only be motivated to work harder by an external system of reward and punishment.

Use of an external inducement as a motivational tool is supported by Dennis (1993) who believed that incentives in the form of praise, encouragement, promotion and even tangible rewards, are all potent sources of motivating learners to want to improve their learning of mathematics. Farrant (1991) stated that externally imposed motivation which includes fear and reward, can spur learners to be more diligent in their learning of whatever- subject. Dworetzky (1988) alludes to the importance of rewards as sources of motivation by saying that people, learners included, like to work even harder when rewarded either through praise, recognition, promotion or other tokens. However, a number of psychologists caution that such rewards can only be meaningful and effective as sources of motivation if they are related to the learners' chronological and cognitive maturity. What motivates young children as rewards may not motivate older children.

Teacher modeling enjoyment: Teacher can motivate learners to want to learn by modeling enjoyment or enthusiasm for a task. Through comments such as "That is one thing I really like about quadratic equations"; Or "That is my kind of approach to solving word problems", Or "That is one of my favourite methods of solving linear equations", Or "I can't wait to solve such a problem using this method." If a teacher models enjoyment and has a good rapport with learners, the chances are good that learners will follow suit, and also enjoy the lesson (Mwamwenda, 1996). According to Mwamwenda (1996), if a learner has a special regard for a particular teacher, he/she will work hard in that teacher's subject for two reasons:

- to please and receive the teacher's approval; and
- to identify with the teacher.

Connecting tasks: A motivation-oriented teacher tries to connect learning tasks to learners' knowledge or experience, or even goes beyond that to motivate learners by personalizing tasks (Green, 2002). Using this strategy, the teacher can use statements such as the following when teaching, "If a sweet costs 5 cents, how many sweets will you buy with one dollar"; Or "Last year you learnt about Pythagoras' Theorem and today can somebody tell me how we can use the same theorem as a step to help find the area of the shape on the board?"

Mentioning the rationale for a task: Green (2002) believes that telling students right from the start the reason for a task they will be required to learn stimulates them to want to learn. Green believes that this will give learners focus as well as develop in them a sense of anticipation about what really will be taught. Teachers can use comments such as "Today we will do some fill-in-the-blanks to find out how much you remember about formulae of different shapes", Or "These formulas will be important later when we do a course in Statistics."

Offering choice: At times learners should be given responsibility for their learning. This according to Green (2002) can be done by the teacher using statements like, "Find a suitable method to

determine the area of a trapezium", Or, "When doing this task, work either individually, in pairs or in any small groups." According to Mwamwenda (1996), offering learners choice to solve given mathematical problems using their own initiatives and methods is an important motivational tool that helps learners to demonstrate their competence. This is confirmed by the competence theory which postulates that the inherent desire by all people to want to perform competently or demonstrate mastery over their environment or body of knowledge or skills, is a potent source of motivation for people to put more effort into their work. Teaching which offers learners choice should satisfy the following conditions:

- learners must assume responsibility for all their learning;
- learners must be offered opportunities to experiment and gain new insights into different mathematical concepts; and
- feedback and reinforcement must be given continuously (Shultz and Shultz,1994).

Keller's motivation model

Keller (1987) proposed a model which he believed could help teachers to make learners' motivation to learn predictable and manageable. The model, referred to as the Attention Relevance-Confidence-Satisfaction (ARCS) motivation model, takes into account four human Characteristics and the motivational dynamics associated with each. The four human characteristics which the ARCS model refers to as requirements for stimulating learning, are the following:

- being able to obtain and sustain learners' attention;
- making learning relevant to learners' needs;
- being able to develop in learners the right level of confidence (not too much or too little) for them to learn effectively; and
- enabling learners to derive a sense of satisfaction from the process or results of the process of learning.

Keller (1987) proposes the following strategies which teachers can use to motivate learners, namely attention-getting; relevance-producing; confidence-building; and satisfaction-generating strategies.

Attention-getting strategies

These strategies according to Keller (1987) are based on the premise that arousing and sustaining attention requires capturing the interest of learners and stimulating their curiosity to learn, through the use of the following sets of activities: perception arousal activities, inquiry arousal activities, and variability.

Perceptual arousal activities: Keller (1987) explains that perceptual arousal is about building an atmosphere of curiosity around learning. For example, any sudden or unexpected change in the environment activates a person's attention such as when there is a change in voice level, light intensity, or humour. Since attention needs to be sustained, Berlyne proposes the use of inquiry arousal activities.

Inquiry arousal activities: Inquiry arousal activities relate to the teacher creating problem solving

situations which can be resolved only by knowledge-seeking behaviour. Problem-solving, experiential situations and environmental factors that evoke a sense of mystery are good curiosity arousers and sustainers according to Keller (1987).

Variability: Diverging from the common routine of introduction-demonstration-practice activities as a teaching sequence with a mediated presentation or group processing activity, can be a welcome change or provide variability in a teaching / learning situation (Keller 1987). Such variability could specifically include change in teaching methods, change in media, or change in even the teaching environment where sometimes lessons are done outside the classroom for direct observation of phenomena.

Relevance-providing strategies

Relevance which in general refers to those things which are perceived as instrumental in meeting needs and satisfying personal desires, including accomplishment of personal goals, is a powerful factor in motivating learning (Keller, 1987). A successful teacher - motivator according to Keller (1987) builds bridges between the subject matter and the learner's needs wants and desires. Keller describes three strategies which a teacher can use to provide relevance, namely goal-orientation, motive-matching, and familiarity enhancing strategies.

Goal-orientation activities: These activities are based on the premise that people are more willing to engage in learning if a skill or knowledge to be learnt is seen as helping them to achieve their goals in the present or future. For example, if a new skill or knowledge is seen as helping one to get a promotion, get a pay rise or help one to avoid being fired from one's job, then one would be more motivated to learn that knowledge or skill. Therefore, teachers need to provide statements or examples, during their teaching, of the utility value of the subject matter are teaching.

Motive-matching activities: Teaching should provide for different learning habits and orientations (Keller,1987). This means that teaching needs to appeal to those learners who enjoy cooperative work, shared success and responsibility as much as to those who believe in individual work and personal responsibility for success. Therefore, teachers need to make their teaching responsive to learner motives and values by providing personal achievement opportunities, cooperative activities, leadership responsibilities, and positive role models.

Familiarity enhancing activities: Keller (1987) believes that people enjoy learning about things they already believe in or are interested in. As a motivating strategy, learning should proceed from the familiar. Therefore, teachers should make teaching materials and concepts familiar by providing concrete examples and analogies related to learners' life world and experiences.

Confidence-building strategies

Providing meaningful success-focused experiences for learners as early as possible during teaching has been observed to be an important confidence-building and motivational strategy (Keller, 1987). Keller identifies the following confidence-building strategies, namely performance requirements, success requirements, and personal control requirements.

Performance requirements: Informing learners what is expected of them in terms of performance, is

one of the simplest ways of instilling confidence, and also developing a much higher expectancy for success. Performance requirements and evaluative criteria should be made clear. To build positive expectations for success in learners, teachers should establish trust and positive" expectations for success by explaining clearly the requirements for success and the evaluation criteria. After creating expectancy for success in learners, teachers should help the learners to experience success as often as possible (Keller, 1987).

Success opportunities: Learners should be assisted to experience success as often as possible by challenging and meaningful tasks. Teachers should support and enhance learners' beliefs in their competence by providing varied and thought-provoking experiences.

Personal control: Base on the premise that most people enjoy having some personal control over the environment, Keller (1987) proposes that a teacher uses instructional techniques that offer personal control as well as provide feedback that attributes success to personal effort.

Satisfaction-generating strategies

Satisfaction-generating strategies include natural consequences, positive consequences, and equity strategies.

The natural consequences strategy: This strategy entails providing learners with as many meaningful opportunities as possible to use their newly acquired knowledge / skills. The teacher can do this by providing problems, simulations, or work examples that allow learners to see how they can solve real-world problems. Case studies and experiential learning are also excellent vehicles for providing meaningful application opportunities (Keller, 1987).

The positive consequences strategy: This strategy entails providing timeouts reinforcements to a learner's success through the use of verbal praise, real or symbolic rewards, and incentives. Learners must be made to feel that their efforts are being noticed and valued as this may give them a great deal of satisfaction.

The equity strategy: To help learners in anchoring a positive feeling about their accomplishments (Keller, 1987), teachers need to make performance requirements consistent with stated expectations, and provide consistent measurement standards for all learners' tasks and accomplishment.

Keller, however, believes that it is not enough for teachers to simply have knowledge and understanding of motivational strategies but also to know when and how to effectively apply each of these strategies. In the systematic motivational design part of the ARCS model, Keller (1987) says that there are basically two requirements that help improve motivation rationally and predictably. The first such requirement is that the teacher should have an understanding of motivation, that is, have an overview of the primary components of what motivates one to learn. The second requirement is that teachers should know what type of strategy to use, how many times to use it, as well as how to apply each of these strategies in a lesson. The above requirements should be taken into consideration when planning strategies to motivate learners since it is not possible to give concrete, generalisable prescriptions for what will motivate any given audience due to too much variability in attitudes, values, or

expectancies of learners.

A problem—solving, heuristic approach to motivational design is therefore proposed by Keller as being more appropriate than prescriptive and algorithmic approaches. Therefore Keller further proposes that an audience analysis be done (Keller, 1987). The purpose of an audience analysis is to identify where motivational gaps are, that is, to identify specific areas in which greater than normal emphasis need to be given in order to stimulate and sustain audience involvement. The objective of an audience motivational analysis is to determine whether the audience will be below, at, or above the appropriate level in each motivational category. Techniques to be used, in conducting audience analysis can range from a "best guess" estimate based on the designer's experience, to a judgement based on scientific collection and analysis of formal data. The present study however, will not include an audience analysis.

Based on Green's and Keller's discussion of motivational teaching strategies, a framework has been designed to categorise motivational strategies against teaching-learning activities which can be used by teachers to motivate their learners. This framework is shown on table 3 below and will form the basis of Section B: Teacher use of motivational strategies, in the questionnaire.

RESEARCH METHODS

Research methods used in this study included survey questionnaire, sample and data collection, and statistical techniques. Each method was carried out according to the following procedures:

Survey questionnaire

The survey questionnaire used in this study focused on the collection of data on motivational strategies that teachers can use to motivate learners to want and like to learn primary school mathematics. The strategies were developed by Keller (1987) and Green (2002). The questionnaire collected data on teacher use of the following motivational strategies: confidence building, commenting positively, valuing tasks, attention-getting, relevance-providing and satisfaction-generating strategies. For data on teacher use of motivational strategies, a 5-point Likert scale was used with the following coding system used: To a large extent (TLE) (5), most of the time (MOT) (4), to some extent (TSE) (3), seldom (S) (2), never (N) (1). The survey elicited responses from primary school teachers teaching level mathematics from standard three to standard seven.

Sample and data collection

The research sample consisted of 200 primary school mathematics teachers selected randomly from 10 primary schools in Masvingo District. The teachers participating in the survey were mailed a cover letter requesting their participation, the survey questionnaire, a stamped return envelope, and a brief summary of the six motivational strategies that are used in the teaching of mathematics. Of the 200 mailed questionnaires, 85 were completed and returned which was a return rate of 42.5%.

Statistical analysis

Statistical analysis in this study utilized the Statistical Package for Social Science (SPSS-X) to compute frequencies, and percentages.

RESULTS OF THE STUDY

Data on teacher use of motivational strategies used the following coding system: 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. Analysis of the findings was thematic using six broad themes as shown below.

Motivational strategies 1: Confidence building strategies

Conditions necessary for attainment of goals

40% of the respondents agreed that they create conditions that enable learners to experience success by setting attainable goals most of the time while 60% agreed that to a large extent they create conditions that allow students to experience success by attaining goals. The above means that 100% of the respondents believe that it is important to help students experience success as often as possible during learning.

Learners' responsibility

27% of the respondents inform learners most of the time of their responsibility (expectations) during learning). 49% of the respondents inform learners some of the time while 34% of the respondents do not inform the learners. The overall picture from the above statistics shows that teachers do not always inform students of their responsibility during learning especially with regards to issues such as participation, commenting and generally raising learning issues.

Learners personal control

Results of the study showed that 22% of teachers allow learners to exercise personal control over their learning environment at times. 45% of the teachers allow learners to exercise personal control to some extent while 33% do not allow learners to exercise personal control over their learning environment. This then means that teachers use teacher-centered strategies most of the time when teaching mathematics rather than use learner-centered strategies which give learners control over their learning.

Feedback that attributes success to personal effort

Results of the study showed that 80% of the teachers give learners feedback that attribute success to personal effort of learners if warranted. 5% of the teachers do not give learners feedback that attributes success to personal effort if warranted while 15% give the feedback at times. This shows that teachers are aware of the motivational impact of giving learners feedback during the learning of primary school mathematics.

Performance standards

Results of the study showed that 85% of the teachers set high performance standards most of the time by providing challenging work to the learners. 15% of the teachers set high performance standards some of the time. The above therefore shows that primary school teachers are aware of the motivational potential of setting of high standards or expectations during their teaching of mathematics.

Providing varied learning experiences

It is shown in the study that that 74% of the teachers increase the learners' belief in their competence by providing varied learning experiences. 26% of the teachers use variety in their teaching materials as a motivational tool. The above means that primary school teachers understand how valuable the role of variety of experiences as a motivational strategy is in the learning of mathematics by learners.

Motivational Strategies 2: Commenting positively

Use of motivational introductory comments

Results of the study show that 90% of the primary school teachers use motivational introductory comments in their teaching of mathematics while 10% do not use these comments. The above information means that there is awareness on the part of the teachers on the importance of using introduction comments to motivate learners during the learning of mathematics.

Process-related motivational comments

60% of the teachers use process-related motivational comments most of the time to motivate learners to learn mathematics while 40% use these comments some of the time. This suggests that primary school mathematics teachers are aware and mostly use process-related comments to enthuse primary school mathematics learners. Process-related comments help the teacher to make a judgement of whether learners have understood the concepts since these comments are given in the form of either questions or prompts.

Conclusion-related motivational comments

54% of the teachers use conclusion-related motivational comments to motivate their mathematics students most of the time. 10% of the teachers use conclusion-related motivational comments some of the time while 36% never use these comments during their teaching of mathematics. The above statistics shows overall that the primary school mathematics teachers have awareness and understanding of conclusion-related motivational strategies as tools for motivating learners during the teaching of mathematics.

Motivational strategies 3: Valuing tasks

New learning tasks

Only 25% of the teachers mention the usefulness or application of new learning tasks during their teaching of mathematics. 14% of the teachers explain to learners the importance of new tasks while 61% do not explain but just go ahead and teach. These results may mean that the

teachers lack confidence to teach new material or that they may not have enough knowledge of the material. This motivational strategy of motivating learners by explaining the importance of new materials/tasks at the beginning of the lessons is therefore not effectively used by the teachers.

Utility value of learning content

Only 25% of the mathematics teachers indicate the utility value of specific teaching/learning content to learners most of the time in order to make learners value their learning. 37% of the teachers explain the utility value some of the time while 38% of the teachers do not. Having only 25% of the teachers motivating learners by explain the utility value of the learning material suggests that either the teachers are not knowledgeable of the motivational strategy or that they have difficulties applying the strategy during their teaching.

Appropriate rewards

75% of the teachers offer learners appropriate rewards for growth, completion of tasks or for excellence most of the time. 15% offer appropriate rewards some of the time while only 10% do not offer appropriate rewards to their students during their teaching of mathematics. The wide use of the above motivational strategy suggests that teachers have knowledge of the motivational strategy and apply it most of the time.

Offer learners choice

40% of the teachers offer learners choice for solving given tasks most of the time. 32% of the teachers offer learners choice for solving given tasks some of the times while 28% do not offer learners choice to solve problems using their own methods at all during their teaching of mathematics. The above suggests that there is either a lack of understanding of the motivational strategy or that the teachers have difficulties using the strategy.

Enjoyment during lessons

84% of the teachers emphasise enjoyment during their teaching of mathematics most of the time by using games, puzzles and competitions while 16% of the teachers do not emphasise enjoyment. This suggests that teachers are aware of the motivational teaching strategy and are also able or comfortable to use it.

Making learning meaningful

51% of the teachers make the learning of mathematics meaningful most of the time by relating tasks to real life experiences. 34% of the teachers seldom relate the learning of mathematics to real life experiences while 15% of the teachers do not relate mathematics tasks to real life experiences at all during their teaching. This therefore suggests that overall the mathematics teachers fairly understand the value of the motivational strategy as a motivational tool and fairly use the strategy during their teaching of mathematics.

Motivational strategies 4: Attention getting

Atmosphere of curiosity

43% of the teachers build an atmosphere of curiosity around all learning by using paradoxes and varied learning media most of the time while 57% of the teachers use the paradoxes and varied learning media some of the time. This information shows that generally teachers are aware of the motivational strategy but do not regularly apply it fairly widely during their teaching of mathematics.

Problem solving situations

46% of the teachers create problem-solving situations to stimulate an attitude of inquiry during their teaching of mathematics by using experience-based teaching methods such as role play most of the time while 54% of the teachers seldom create problem-solving situations to stimulate an attitude of enquiry in the students during their teaching of mathematics. The above information shows that teachers have a fair knowledge of the motivational strategy and generally make fair attempts to use the strategy to motivate learners to effectively learn mathematics.

Creating an inspiring learning atmosphere

43% of the teachers most of the time create an inspiring learning atmosphere around all learning of mathematics by injecting personal and emotional material such as using learners or the teacher as an example in a mathematics problem to be solved. 32% of the teachers sometimes create an inspiring learning atmosphere for their mathematics students while 25% of the teachers do not. This statistics shows both a fair understanding and use of the motivational strategy by primary school mathematics teachers.

Use local environment and resources

40% of the teachers use the local environment and resource persons as a motivational strategy most of the time to widen the repertoire of teaching approaches. 48% of the teachers use the local environment and resource persons to some extent as a motivational strategy while 12% of the teachers do not use the motivational strategy. The above statistic shows a fair understanding and use of the motivational strategy to motivate learner during the learning of mathematics.

Communicate content simply

91% of the teachers communicate content in simple terms most of the time as a way of motivating learners during the learning of mathematics. Only 9% have problems in communicating mathematical content simply during their teaching. These results show that most of the teachers have knowledge and are able to communicate the content they teach in ways that are simplified and that enable their students not only to understand mathematical concepts but also to like learning mathematics.

Motivational strategies 5: relevance-providing strategies

Teaching relative to learners' motives

17% of the teachers relate all teaching of mathematics to learners' motives and values by providing personal achievement opportunities, co-operative activities and leadership

responsibilities most of the time. 43% of the teachers relate all their teaching of mathematics to learners' motives and values some of the times while 40% do not relate their teaching to the motives and values of the learners. These results suggest that most of the primary school teachers have difficulties relating what they teach to learners' values and motives with regards to providing opportunities for learners to experience success as often as possible and also the teachers do not give the learners enough opportunities to assume leadership responsibilities during teaching.

Making learning material familiar

36% of the teachers make learning materials familiar to their learners' life experiences most of the time while 33% of the teachers make the materials familiar to the learners' life experiences some of the time. 31% of the teachers do not attempt to make the materials familiar to the learners' life experiences but just teach according to how the material is presented in the text books. This then shows that almost about one third of the teachers do not put the learning materials in the context of their students, ie, do not present their lessons in ways that learners associate with their everyday experiences and understand.

Motivational strategies 6: Satisfaction-generating strategies

Meaningful opportunities

37% of the teachers most of the time provide meaningful opportunities for learners to apply what they have learnt and to solve real world mathematical problems. 40% of the teachers sometimes provide these opportunities while 23% of the teachers do not provide these opportunities. Teachers therefore seem not to be able to provide real-life problems for learners to solve during their learning of mathematics hence their (teachers') failure to widely use this motivational strategy during their teaching of mathematics.

Rewarding Success

49% of the teachers ensure that they reward students for success in the solving of mathematical problems timeously and continuously most of the time. 39% of the teachers reward students' success for timeously and continuously solving mathematical problems some of the times while 12% of the teachers do not reward students' success at all. This shows that overall there is a fair attempt by teachers to reward success as often as possible as a motivational strategy though still more needs to be done.

Catering for individual differences

49% of the teachers cater for individual differences as a motivational strategy most of the time during their teaching of mathematics. 46% of the teachers cater for individual differences some of the times during their teaching of mathematics while 5% do not cater for individual differences during their teaching of mathematics. The above statistics therefore show that the level of use of this motivational strategy is overall average by mathematics teachers in primary schools is overall close to satisfactory meaning that there is a noticeable attempt to use the strategy by the teachers as a way of attempting to motivate mathematics learners.

Provide consistent measurement standards

89% of the teachers most of the time provide consistent measurement standards for all learners' tasks and accomplishments as a motivational strategy. 11% of the teachers provide the measurement standards some of the time. This shows that mathematics teachers are able to give students challenging assignments and tests which are within their level of ability as a way of measuring students understanding and also as a way of challenging and motivating their students to aim higher in their performance.

DISCUSSION AND CONCLUSIONS

Primary school teachers widely use confidence-building motivational strategies in their teaching of mathematics. Providing meaningful success-focused experiences for learners during teaching of mathematics has been observed to be an important confidence-building and motivational strategy (Keller, 1987). Such confidence-building strategies include creating conditions that enable learners to experience success as often as possible, informing the learners of their responsibilities during learning and setting high performance standards by providing challenging tasks. These results therefore indicate that primary school teachers have a good knowledge of confidence-building motivational strategies and apply them regularly. This is also supported by the fact that documents analysed which included scheme books and plan books showed that teachers regularly include these strategies in their plans and lesson evaluation records also showed that there is frequent use of these strategies by teachers during the teaching of mathematics.

Most of the teachers provide positive comments to their students during their teaching of mathematics. Providing positive comments is viewed as important in motivating students to learn mathematics as confirmed by Keller (1987). These results therefore show that primary school teachers frequently use positive comments to motivate their students during the learning of mathematics and may also be indicative of the fact that the teachers have a sound understanding of the role of positive comments in motivating students to learn mathematics.

There is a satisfactory level of application of the task-valuing strategies during the teaching of mathematics by primary school teachers as results show that around 50% of the respondents use the motivational strategy during the teaching of mathematics. This scenario shows that either teachers are not aware of the task-value motivational strategies or they have problems using them during mathematics teaching. Document analysis also showed that teachers rarely include these strategies as part of lesson planning and by extension, less frequently use the strategies during their teaching of mathematics.

There is satisfactory level of application of the attention-getting strategies during the teaching of mathematics by primary school teachers. Attention-getting strategies relate to the teachers ensuring that they are able to attract the attention of their students during the learning process. The above statistics show that these teachers do not effectively use this strategy during their teaching perhaps because they have difficulties building an atmosphere of curiosity around

learning, fail to create problem-solving situations to stimulate an attitude of enquiry, fail to vary teaching approaches by using media, resource persons, games and puzzles, fail to communicate learning material simply and clearly to learners, fail to create an inspiring emotional learning atmosphere by injecting personal and emotional examples during teaching or a combination of these.

Since 53% of the teachers use the relevance-providing strategies to motivate their students during the teaching of mathematics, the application of these strategies is average. These results show again lack of effectiveness in the use of relevance-providing strategies and hence failure by teachers to effectively motivate their students during the teaching of mathematics. There was also evidence from the scheme and plan books of most teachers that the majority of the teachers do not regularly plan to use these strategies during their teaching of mathematics. This certainly shows either a lack of understanding of the strategies or inability to effectively apply the strategies causing teachers to ignore them during their teaching

The use of satisfaction-generating strategies during the teaching of mathematics by primary school teachers according to results of this study is generally satisfactory as shown by the responses of 56% of the respondents. This situation is again indicative of the fact that either the teachers have little knowledge of the satisfaction-generating strategies for use during their teaching of mathematics or that they have problems implementing them.

Overall, failure to effective use motivational teaching strategies in the teaching of primary school mathematics by teachers could be attributed to two major issues namely high workloads and large class sizes..

From the results of this study with regards to teacher use of motivational strategies in the teaching of mathematics in primary schools, the following conclusions can be made:

- Teacher use of motivational strategies to motivate students during the teaching of mathematics is fairly satisfactory and needs to be improved for students to benefit better from the teaching; and also that
- Failure by mathematics teachers to more effectively use motivational teaching strategies during their teaching of primary school mathematics is caused by high workloads and large class sizes. For teachers to improve their use of motivational strategies in the teaching of mathematics in primary schools it is therefore recommended that:
 - Teachers need to attend more training on the use of motivational teaching strategies with regards to the teaching of mathematics in particular.
 - Schools need to monitor more regularly how teachers plan for the use of motivational techniques so as to identify areas where the teachers need assistance for them to improve.
 - School headmasters, supervisors and principals need to target teacher use of motivational techniques during class observations so as to be able to capture early the weaknesses of the teacher and offer professional assistance, and crucially, these schools administrators need to ensure that workloads for teachers leave them with time to plan adequately for the use of motivational teaching methods.
 - Schools need to create learning communities so that teachers can share ideas about effective ways to motivate their students during teaching the teaching of mathematics.

FUTURE RESEARCH

This research proposes that future research could also look at the perception of teachers towards the use of motivational strategies in their teaching of mathematics. This is so because one reason why teachers do not widely and regularly employ motivational strategies in their teaching of mathematics could be attitudinal rather than knowledge. Another research could also look at the knowledge level of the teachers about the different motivational strategies for use in the teaching of mathematics in primary schools.

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