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# Titillating Adolescents at School: Secondary School Mathematics Teachers' Views on How to Motivate Adolescent Learners in Zimbabwe

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**Abstract :** *The quest to establish how best to harness secondary school learners' energy so as to channel it towards academic issues primed the current study. The subject of how to motivate learners has received attention for several decades in the academic world and it is still relevant and topical. The study was based on a number of psychological theories which include cognitive, behavioural and humanistic perspectives on motivation. The descriptive survey research design was adopted.Questionnaires with both closed and open-ended were used as data collection tools. The stratified random sampling method was used to generate a sample of 30 secondary school Mathematics classroom practitioners with a post-teacher-training teaching experience of at least five years. A myriad of ways of motivating secondary school learners was highlighted by the research participants. Examples of the suggested motivational strategies entail navigating the learners' zones of proximal development, giving positive verbal and written comments, building the self-efficacy of among the learnersand highlighting the relevance of what is the content being learnt at school to the employment world. The study recommended that classroom practitioners should always endeavour to motivate learners so that they can ultimately devote their energy to lucrative academic activities.*

***KEY WORDS:*** **Intrinsic motivation, extrinsic motivation, adolescence, zone of proximal development, self-efficacy, modelling.**

## I. INTRODUCTION

Stakeholders of the education fraternity such as learners, teachers, parents employers and the community in general are enthusiastic to establish the extent to which the various subjects being studied by learners help them to solve existential problems and function effectively in the world of work. One subject which is closely monitored by these stakeholders is Mathematics. A pass in secondary school Mathematics normally opens numerous tertiary training and employment avenues for learners (Kufakunesu, Chinyoka& Ganga, 2011). A number of studies have attempted to explore the relationship between learners' levels of motivation and their academic performance in Mathematics. Mwamwenda (2004) posits that without motivation, it remains practically difficult to make learners to engage in academic activities. The hallmark of the current study is to scrutinise the various way which secondary school Mathematics teachers can employ to motivate learners to learn the subject.

## II. BACKGROUND TO THE STUDY

Etymologically, the word motivation is a derived from the Latin word *movere* which means to move (Gazzaniga& Heatherton, 2006:343). Motivation as a psychological construct can be defined as the reason for directing one's energy and effort on a particular activity (Gerrig& Zimbardo, 2006). Tucker, Zayco and Herman (2002:477) in Kufakunesu (2015) indicate that in the education fraternity, motivation deals with the cognitive, emotional, and behavioural indicators of student investment in and attachment to education.There are two broad categories of motivation which are intrinsic motivation and extrinsic motivation (McLean, 2003:9). According to Lahey (2009:372) intrinsic motivation is when an individual engages in an activity solely because of liking and enjoying the processes constituting the activity and not because of attempting to gain the external rewards associated with the activity. On the other hand, extrinsic motivation is when a person engages in a particular activity simply because one wants to get the rewards attached to the task (Santrock, 2004:418; Lahey, 2009:372).The current study explored how both intrinsic and extrinsic motivation can be employed by teachers to motivate secondary school Mathematics learners.

The utility of Mathematics as a subject has been well documented in virtually all parts of the world. According to Nziramasanga (1999) and Awolola (2011:91) in Kufakunesu (2015), the industrial, technological and economic prosperity of any country can be mediated by the citizens' mathematical acumen. Mahanta and Islam (2012:713) point out that Mathematics promote learners to undertake real life problem solving. Moreover, sound academic performance in Mathematics can cascade to better educational attainment in allied academic disciplines such as Accounting, Physics, Chemistry and Economics (Kufakunesu, 2015). According to Kufakunesu et al (2011) a pass in secondary school Mathematics is usually a prerequisite for one to be enrolled in various forms of post-secondary school training. Consequently, a study exploring how to spur secondary school learners to study Mathematics is likely to yield vital results to educators, parents, employers, the community, curriculum planners and learners themselves.

The decision to embark on the current also emanated from realising that Mathematics is a crucial component of the STEM curriculum which Zimbabwe as a country is currently pursuing. According to Dekeza and Kufakunesu (2017:11) and White (2014:1), STEM is an acronym representing Science, Technology, Engineering and Mathematics. Dekeza and Kufakunesu (2017:11) view STEM education as an interdisciplinary approach to instruction and learning in which the various academic disciplines are merged with real world lessons as learners apply Science, Technology, Engineering and Mathematics to tackle community, work and global existential problems. According to the Australian National STEM Education Strategy (2015), the school is a strategic platform to launch the STEM programme. It is expected that adopting STEM can go a long way towards generating scientists and engineers who are needed for economic development (Thomasian, 2011:8; Gadzirayi, Bongo, Ruyimbe, Bhukuvhani&Mucheri, 2016; Dekeza& Kufakunesu, 2017:11).

The Nziramasanga Commission of inquiry scrutinised the state of education in Zimbabwe in 1998 and generated a report in 1999 (Nziramasanga, 1999). The inquiry established that learners have negative attitudes towards Mathematics as an academic discipline for several reasons which include previous failure and poor mastery of elementary concepts taught at lower academic levels. Several authorities confirmed that Mathematics is generally regarded as an intricate subject not only by learners but by some parents. While Petty (2009:510) confirms that many learners openly declare their despair and helplessness when it comes to learning Mathematics. Saraswathi (2003: 326) indicates that Mathematics is rated by many learners as a serious intellectual challenge. Such negative attitudes towards Mathematics on the part of learners can be minimised by motivation employed by classroom practitioners, hence the need to explore ways to motivate learners.

Several studies regarding the motivation of learners have been conducted in different parts of the world including Zimbabwe. One such studywas undertaken by Mufanechiya and Mufanechiya (2011) when they explored the challenges associated with motivating secondary school learnersin Zimbabwe. The study examined the variables which militated against learners' motivation from the point of view of teachers, parents and the learners themselves. Mufanechiya and Mufanechiya (2011) established that learners had low motivational levels to learn principally because of bleak employment prospects. However, the study by Mufanechiya and Mufanechiya (2011) did not focus on the academic performance of secondary school learners in Mathematics as a specific academic discipline. Consequently, the current study endeavours to close that gap by focusing on how secondary Mathematics teachers can motivate learners to learn the subject more readily.

Numerous studies have been undertaken to explore the association between learners' academic performance in Mathematics and their levels of motivation. One such study was conducted by Md.Yunus andAli (2009) and the results of their study confirmed that the learners' academic performance in Mathematics increase or decrease together with variables such as motivation, self-efficacy and effort applied. Another related study was undertaken by Mousoulides and Philippou (2005) in which motivation and self-efficacy were found to be good mediators of learners'academic performance in Mathematics. Although the outlined studies served to highlight the utility of motivation in elevating learners'academic performance in Mathematics, the studies did not delve on how classroom practitioners can practically motivate secondary school Mathematics learners. Therefore, the current study remains necessary.

A nineteenth century psychologist called Stanley G. Hall described adolescence as a period of storm and stress (Dacey &Travers, 2002; Kufakunesu &Chinyoka, 2017:26). Adolescence is the stage of human development in which a child changes to become an adult (Mwamwenda, 2004; Lahey, 2009). It is not only characterised by anatomical changes such as the development of primary and secondary sex characteristics but is also accompanied by changes in hormonal compositions which trigger emotional and social transformations (Kufakunesu &Chinyoka, 2017). Characteristically, adolescents demonstrate erratic moods and volatile behaviour. Moreover, adolescents are exceptionally rebellious, experimental and prone to peer pressure (Kufakunesu &Chinyoka, 2017; Tuckman &Monetti, 2011:117; Melgosa, 2008:94). Erikson maintains that adolescents are in a stage called identity versus role confusion, where they are dominantly concerned with developing an identity and decide on the career path to pursue (Kufakunesu &Chinyoka, 2017). Secondary school learners are dominantly adolescents and exploring their attributes can help to identify how they can be motivated to learner Mathematics.

## III. THEORETICAL FRAMEWORK

Skinner propounded the operant conditioning theory which is based on the principle of reinforcement. The hallmark of reinforcement is that the probability of the repetition of a behaviour hinges upon it consequences (Feldman, 2009). This implies that Skinner believes that motivation can be done through the use of extrinsic rewards. Desirable behaviour can be strengthened by giving favourable stimuli after the demonstration of such behaviour. Bandura, who advanced the social learning theory, suggested that apart from reinforcement, learning can also occur through observational learning, that is, learning through imitation (Kosslyn & Rosenberg, 2006; Mwamwenda, 2004).Learners need to be motivated to imitate the behaviour demonstrated by role models (Bandura, 2002). The models must have interpersonal attractiveness for learners to imitate them. Closely related to the aspect of motivation is an individual's self-efficacy. According to Bandura, self-efficacy is an individual's belief in his or her ability to successfully perform a given task (Kufakunesu &Dekeza, 2017; Feldman, 2009). Learners with high levels of self-efficacy have high levels of intrinsic motivation (Rao & Rao, 2003).

Cognitive theorists such as Piaget and Bruner suggest that the use of teaching aids and employing discovery learning techniques can go a long way towards motivating learners at different stages of cognitive development (Snowman, McCown&Biehler, 2009). Giving learners challenging but manageable tasks can also motivate learners (Santrock, 2004). Vygotsky, who advanced the sociocultural theory, maintain that learners can be motivated by scaffolding them as they attempt to navigate their zones of proximal development. The zone of proximal development is the difference between what learners can accomplish after getting external assistance and what they can do when working independently (Kufakunesu &Dekeza, 2017). Scaffolding is Vygotsky's term for the temporary support which is given to a learner by those who arecompetent till the learners masters all the required concepts or skills (Mwamwenda, 2004).

Humanists such as Maslow and Rogers believe that learners can be motivated so that they pursue their quest for self-actualisation. According to humanists, self-actualisation is an individual's inherent desire to exhaust one's potential by becoming the best one can be (Kufakunesu &Dekeza, 2017). Maslow maintains that human beings can be motivated by having their hierarchically arranged needs met. The hierarchy commences with the basic physiological needs progressing through security, love and belonging needs to self-actualisation (Feldman, 2009). On the other hand, Rogers postulated that human motivation can only occur when one is granted unconditional positive regard, empathy and genuineness. According to Kufakunesu (2011:19) and Mpofu(2006) unconditional positive regard is love, acceptance, respect and recognition which are given to an individual with putting any prerequisites. Empathy is the ability to interpret someone else's situation from the point of view of that person (Rogers, 1957). Genuineness is concerned with transparency and realness during interaction (Mpofu, 2006: Kufakunesu, 2011:19).

## IV. GUIDING RESEARCH QUESTIONS

The study was an endeavour to answer the following questions:

- What is the utility of motivation in academic circles?
- How do Mathematics classroom practitioners endeavour to motivate adolescent secondary school learners in Zimbabwe?

## V. RESEARCH METHODOLOGY

The researcher adopted a qualitative research methodology specifically using the descriptive surveyresearch design. The researcher considered the descriptive survey to be suitable for the study because it is the research design which is appropriate when one wants to explore opinions, attitudes, perceptions and views (Sidhu, 2001; Kufakunesu, 2011:31). Questionnaires with open-ended items were employed as data gathering instruments. A questionnaire is simply a document on which items to be responded to by the research participants (Kufakunesu &Chinyoka, 2017:95). The literacy level of the teachers who happened to be the respondents and their hectic professional programmes they have led the researcher to use questionnaires as data gathering instruments rather than interviews or focus group discussions (Kufakunesu &Dekeza, 2017).

The stratified random sampling method was used to generate a sample of 30 secondary school Mathematics teachers in Masvingo Province in Zimbabwe. Stratification was done according to the highest professional qualifications of the respondents and the geographical locations of their schools, that is, urban or rural schools. The 30 secondary school Mathematics teachers who took part in the empirical investigation had a post qualification teaching experience is at least five years. Demographically, the respondents had average age of 40.7 years and a standard deviation of 8.61years. Of the 30 secondary school teachers who took part in the study, 11 were female while the remainder were male. Fourteen of the respondents had undergraduate degrees while nine had postgraduate teaching qualifications with the remainder having a Diploma in Education.

Throughout the entire research process, the researcher was alert to ensure that ethical principles were observed. Examples of ethical principles which the researcher observed were anonymity, informed consent, and

non-maleficence. In an attempt to heed the ethical principle of anonymity, the researcher asked the respondents not to write their names on the questionnaires (Chiromo, 2006:1). According to Keenan (2002:66) and Kufakuneu (2011:39) the ethical principle of informed consent requires that the potential research informants should arrive at the decision to participate in a given study after being given all the relevant information regarding what the research entails. The data collection procedure did not expose the research participants to any physical, emotional or psychological harm; hence the ethical principle of non-maleficence was observed.

## VI. RESEARCH FINDINGS

- All the 30 research participants agreed that motivation is an important variable in the teaching and learning matrix not only in Mathematics but in all fields of learning.
- Mathematics learners can be motivated by addressing some factors which have to do with the learners themselves.
- Twenty-two out of the 30 respondents suggested motivation methods which are related to the instructional methods be employed by the teachers
- The respondents also suggested others ways of motivating learners apart from manipulating learner and teacher variables.

## VII. DISCUSSION OF FINDINGS

Regarding the usefulness of motivation in enhancing the academic performance of learners in Mathematics, all the 30 research informantsunanimously concurred that motivation is one of the key determinants of learners' educational success among other competing variables such as intellectual endowment and the quality of human and material resources available. The views of the research participants generally agreed with the sentiments and findings of earlier researchers such as Rao and Rao (2003:23) who maintain that the success and achievement of a learner in life in general and in academic spheres in particular sometimes depend on the learner's level of motivation.Moreover, the research findings of previous researchers such asTella (2007) and Mousoulides and Philippou (2005) which established that motivation plays an important role in the Mathematics teaching and learning matrix were reiterated by the respondents in the current study. While acknowledging thatmotivation is not a panacea to all the pedagogical challenges associated with the teaching and learning of Mathematics, the research participants underscored the view that motivation must be seriously considered in the Mathematics education arena.

Numerous ways of motivating secondary school learners were suggested by the research informants. Firstly, the informants highlighted ways of motivating learners by focusing on learner variables. On the basis of the data which featured on the completed questionnaires, the respondents either directly mentioned or alluded to the idea that learners can be motivated by cultivated a sense of self-efficacy in doing Mathematics. As theorised by Bandura in his social learning theory, self-efficacy is an individual's belief in his or her ability to accomplish a given task (Bandura, 2002; Kufakunesu &Dekeza, 2017). The classroom practitioners suggested that Mathematics learners can be intrinsically motivated by verbally encouraging them to believe in their own abilities. To reinforce a sense of achievement and mastery among learners, classroom practitioners can give learners activities which are challenging enough to engage their minds but easy enough to inculcate a sense of self-efficacy. Rao and Rao (2003) and Kufakunesu and Dekeza (2017) outline that people with a high level of self-efficacy normally apply more effort to achieve a given task as a way of trying to convince themselves that their original belief in their abilities was right. It was also proposed that learners can be motivated extrinsically by giving them favourable verbal and written comments whenever they successfully accomplish some mathematical tasks. This was consistent with Skinner's principle of positive reinforcement (Feldman, 2009). Another method of motivating learners which was suggested by some of the research informants was to reward learners who do well in the presence of other learners so as to foster vicarious reinforcement. The principle of vicarious reinforcement is part of Bandura's social learning theory which suggests that people can be influenced by the results of other people's behaviours (Bandura, 2002).

By virtue of being adolescents who clamour for recognition and attention, classroom practitioners can motivate them by giving them posts of responsibility. Sixteen out of the 30 respondents suggested that secondary school learners can be motivated by giving them responsibilities such as being group leaders on rotational basis. That would accord each learner the chance to bask in the glory of leading others even for a short period of time. Allowing learners to work collaboratively also can helps to meet the belonging needs of the learners as postulated by Maslow in his need theory (Kosslyn & Rosenberg, 2006). In support of the above sentiments, one female secondary school Mathematics teacher wrote the following statement as her questionnaire response:

> *Having a post of responsibility can go a long way towards sprucing up the self-esteem and self-efficacy of adolescent learners in academic circles. Such feelings of personal worth and recognition among peers can*

*translate to motivation to engage in academic activities in seemingly challenging academic disciplines like Mathematics.*

In response to questionnaire items, twentyout of the 30 respondents, that is, 66.7%,indicated that Mathematics teachers can regulate their instructional methods in a bid to motivate learners. The respondents proposed that Mathematics teachers can properly sequence mathematical topics so that concepts are delivered from simple to complex and known to unknown as implied by cognitive theorists such as Piaget and Bruner. Moreover, the use of teaching aids was strongly encouraged by the informants since some of the learners would still be operating at the concrete operational stage as suggested by Mwamwenda (2004). To make learning more relevant and appealing to learners, some research participants suggested that Mathematics teachers must habitually avail past examination papers to learners so that they feel encouraged by correctly solving some questions from the formal examination papers. Moreover, some Mathematics teachers who took part in the study opined that teachers should not condemn or ignore partially correct responses from learners. Instead, classroom can motivate learners by scaffolding them by giving them hints so that they correctly modify their partially incorrect contributions during lessons. This was consistent with the principle of scaffolding which is one of the principles of Vygotsky's sociocultural theory.

The use of humanistic teaching principles suggested by Rogers was singled out as a way for motivating learners. The research participants suggested that learners can be motivated by being accepted by significant others such as teachers. Teachers can intrinsically motivate learners to study Mathematics by showing them general warmth and introducing tension-free classroom settings. Imposition of conditions of worth on the part of the learners was pointed out as one reason why learners may resent Mathematics, hence the need for unconditional positive regard. Being real and transparent when interacting with learners was given by some respondents as a way of cementing the social relationship between the teachers and the learners. A healthy social relationship between learners and teachers has a probability of intrinsically motivating learners to learn Mathematics (Kufakunesu, 2015). Furthermore, showing empathy by means of understanding the social, economic and physical contexts in which the learners operate was mentioned by 15 respondents as a way motivating learners.In support of the principle of empathy, one male respondent wrote:

*Mathematics teachers need to be considerate and observant so that they conduct themselves in ways which are consistent with the settings of the learners. The socio-economic variables surrounding the learners should be acknowledged as a way of establishing a working relationship with the learners.*

The implications of Bandura's social learning theory were echoed by some respondents when they made reference to the principle of modelling. Thirteen respondents remarked that generally teachers are role models in the education fraternity and the way they perform their professional duties can either motivate or frustrate learners. This category of respondents suggested that Mathematics teachers can motivate learners by presenting themselves as diligent, enthusiastic and humanistic educators who seem to be enjoying Mathematics. Such an array of positive energy can foster favourable attitudes towards Mathematics on the part of the learners. The respondents maintained that positive attitudes towards Mathematics on the part of the learners could eventually translate into some form of motivation to study the subject.

Rather than concentrating solely on the teacher and learner variables pertaining to motivation, 40%, that is, 12 out the 30 respondents referred to some factors which are not directly linked to learners or instructional methods. The respondents suggestedthat career guidance and counselling experts could be granted the opportunity to address secondary school Mathematics learners to emphasise the utility of Mathematics as an academic discipline in the various forms of tertiary training. Bringing to the attention of learners the role played by Mathematics during higher and tertiary education and in the world of work can to some extent motivate learners to learn Mathematics more seriously in anticipation of enjoying the benefits of the subject after leaving high school. One respondent suggested that former learners who have passed Mathematics and are reaping the benefits of passing Mathematics in the world of work should be invited to schools to address learners and convince them that passing secondary school Mathematics can open various avenues in the world of work. However, the respondent was cautious enough to regret the prevailing situation where employment prospects are not as promising as they used to be at least two decades ago as alluded to by Mufanechiya and Mufanechiya (2011).

## VIII. CONCLUSION

The current study was an attempt to examine how secondary school Mathematics classroom practitioners can motivate learners. The research participants concurred that motivation is a vital variable in determining secondary school learners' academic performance in Mathematics. Numerous ways of motivating Mathematics learners both intrinsically and extrinsically were suggested by the research informants. The study established that secondary school learners can be motivated by manipulating variables having to do with the learners, the methods of teaching and the teachers themselves. The researcher feels that combining the various motivational methods suggested by the respondents can to some extent yield positive results.

## IX. RECOMMENDATIONS

The outcomes of the current study led the researcher to make the following recommendations:

- Educators should attempt to motivate learners at virtually all levels of education in all academic disciplines.
- School administrators should make efforts to avail the material resources which can be used to motivate Mathematics learners.
- The current study can be replicated by interested researchers just as it is or with variations in theoretical orientation, research design, sample composition and instrumentation.
- Other researchers can also explore how teachers of other academic disciplines apart from Mathematics attempt to motivate their learners.

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