



Review Article

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Review on Students Interest and Self-Motivation to Learning Mathematics education in Ethiopian



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Abstract

A review of Articles the effect of student attention and self-forced rewards mathematics special education. The review implications of the strategies designed to promote intrinsic motivation is presented Mathematics Education. Each and every one subject are indispensable for learner and educator, but mathematics teaching serves a all-purpose reason of school to build up human beings psychologically, in good physical shape and in the flesh It makes populace imaginative and accountable. One part of the assemblage presents line of attack for all students, and the other part contains strategies for students. Aggravated students understanding school success because they display behaviors such as choose challenging activities and spending more time on task. Nowadays Mathematics Education can create a fundamental revolution in education. This consists of a variety of tools that help to provide learning materials and support the learning process to achieve learning goals in Mathematics Education. Review believed that from immemorial time, transfer knowledge; the rapid penetration of information technology among people has changed their lifestyle Mathematics Education. The rapid evolutions from the application of technology including productive and information technologies in human life have brought about dramatic changes in industrial, economic, political, and civil structures of societies and these changes have been a significant impact on the life and work of people around the world and seriously dealt with the traditional methods of teaching, learning and educational. The use of rewards undermines intrinsic motivation and results in the slower acquisition of skills and more errors in the learning process.

Keywords: Mathematics Education; Fundamental Revolution

Introduction

Based on occurrence with mathematics at discipline, student“ build up wide-ranging attitude about its environment and value and about their own ability and meditation in doing it [1]. Attitudes and behaviors are repeatedly considered by means of self-report which facilitate financially viable survey manner to be in employment on a bulky weighing machine which hold that instructional method that are extremely successful with greenhorn learners. Additional more students’ attitudes and behaviors have been established to be subjective by school and classroom factor. Attitude seen as cognitive and effective orientation or disposition towards an object, idea, person, and situation [2]. The absence of academic motivation and lack of interest is also likely to be mathematics students’ neglect of their studies. Research over the last two decades has indicated that adolescents’ academic motivation declines over time. Recent learning show that as children get older, their interests and attitudes toward school in general and toward specific subject areas such as mathematics, art, and science tend to deteriorate [3]. Informally, interest is defined in Collins Dictionary as “something that happiness you and attracts your attention so that you want to learn or hear supplementary about it or continue

doing it.” Self-motivation can also be defined as the “motivation arising from an individual’s internal desires for the satisfaction and fulfillment of definite needs. In recent times, the ministry has premeditated and implement teaching subdivision expansion program to make stronger human possessions development by preparation knowledgeable and ground-breaking people with special attention to engineering, technology and natural sciences, through introduce high quality discipline and mathematics curricula at primary and less important schools and the approve rule of the 70:30 university intake ratios in goodwill of science & technology [4]. Consequently, my understanding showed that most students in secondary schools think that mathematics is difficult, and they lacked interest and personal enthusiasm for mathematics. The review think upon these; can it be that the mathematics instructors around these individuals are not good in mathematics or that these mathematics instructors will not know how well to guide their students in patience, so that the total impression made by these mathematics instructors is deadening. The reviewer believes his experience are the baseline for further studies to carry out a more focused and comprehensive research

and will use a very unique approach by introducing variables that have not been examined by earlier researchers; he investigates how math anxiety, its usefulness, the condense of the student, and student inspiration affect their interest in mathematics quantitative approach. The review will let somebody be on familiar terms with the educational institutions on these variables in the formation of students' interest.

Objective of the Review

The purpose of this review interest and self-motivation make tote learning of mathematics education.

Review litterateurs

Motivation in Mathematics Education: High student realization comes from students who are motivated from inside. For that reason, instead of giving rewards, teachers need to consistently teach students to become fundamentally motivated. Student motivation affects every aspect of school life, from attendance, to educational performance, to extra-curricular activities. Promoting the maximum student motivation possible is extremely important for every teacher especially in today's instructive climate, where schools are continuously under pressure to improve test scores, responsibility [5]. And accountability. Students with learning disabilities face even greater challenge each day as they walk into classrooms. Because these students can struggle with the easiest of tasks presented by teachers, students with learning can seem like the most unmotivated of all, going to extremes not to show their weaknesses. As a result of these pressures, teachers bombard students with the promise of rewards; stickers for good behavior, treats for completing assignments, lunches for turning in homework. Of all the rewards given, grades are the most common reward [6]. There is a need to train teachers in how to teach students so that they become intrinsically motivated, instead of just propelled along by the vision of the next external reward. The key factors are to create an autonomous classroom environment, and to teach students to perceive themselves as decision makers. Teachers also need to feel that they are in control of the material to be taught, how to teach it, and how to teach the students to be in control of the content. These strategies do not often appear in reading methods texts or math books, although they are key issues in improving the achievement of all students. Students have been rewarded for good behavior for many years, even before the development of Skinner's theory of operant conditioning. In the 1800's New York City established a token economy as a means of rewarding correct schoolwork and punishing school offenses [7]. In fact, though, it was the theory of operant conditioning that leads to the widespread use of rewards in the classroom. Basically stated, operant conditioning means that if a reinforcer is delivered after a certain behavior, then the behavior will be strengthened. A reinforcer is no matter which given that will increase the chance of the behavior happening again. In school, reinforcers usually are things like stickers, praise, treats, and grades. While operant conditioning was gaining in popularity, motivation theorists were

changing their ideas. Researchers were rejecting the idea that man is motivated by drives and instincts alone, and accepting the idea that man is motivated by sources both inside the body and outside in the world [8]. In the 1970's Edward Deci [9,10] defined the poles apart kinds of motivation as intrinsic motivation and extrinsic motivation, intrinsic motivation is the act of completing an activity for the pleasure of doing the activity itself. In research conducted during the last 50 years, it has been established that intrinsic and extrinsic motivations have different effects on education. The presence of intrinsic motivation produces many behaviors that result in school success like sustained interest in tasks, hazard taking, and the conquering of new challenges [11-13]. Children with learning disabilities have even been shown to execute at levels higher than what was expected by psychological tests [14]. External rewards, however, tend to have negative effects in school. Different forms of extrinsic motivation tends to take attention away from the most important aspect of school, a child's learning. Rewards can undermine intrinsic interest in an activity, and even deter a person from returning to an activity later [8-10, 15]. In addition, rewards have been shown to have detrimental effects on the process of learning found that rewards resulted in more [16].

Mathematics Teaching for Intrinsic Motivation

A familiar subject matter in the research regarding intrinsic motivation is the expansion of an autonomous classroom climate. When children experience in control of their surroundings, they are not only on the inside motivated to work, but also familiarity positive feelings of self-worth [17]. It is also important to note that even though a teacher may feel that the environment is autonomous, the child may perceive it in a different way. A child's perception of the environment should be taken into consideration when developing an education plan (Adelman, 1989). Creating an environment where kids see themselves as having control is one where they have some choices. Giving children choices in their learning can be a very authoritative tool in developing intrinsic motivation [12]. Alfie Kohn [18] has not compulsory many ways to give children choice in the classroom. With respect to academic learning, children can make choices in what they learn simply by choosing what trade book to read. Students make a decision how to gain knowledge of by decide on what types of groups to work in, or where they will work in the classroom. Students can make choice in how well they learn by helping to establish the criteria by which their material will be graded. Finally, students need to engage in discussions about why they become skilled at certain things in school. Kohn also points to the significance of including children in deliberations about social and behavioral issues in the classroom, such as rules and procedures. In addition to Kohn, other researchers have stated the importance of involving students in the decision manufacture process going on in the classroom [12]. Saw that giving small children a choice of materials for an art project produced better art projects. Also, giving students learning options, helping them to sample the options, and then

decide on a particular option deeply involve students in their own learning process [11]. Not only have student made decisions about their knowledge, but they have also experienced monitoring and evaluation skills.

Student decision making not only helps in the liberation of content information but can also be an important part of a behavioral organization program. In addition to the classroom climate, children require to receive instruction cover areas relevant to intrinsic motivation. As a result of receiving personal causation training, both teachers and students in grades 5,6, and 7 felt like they had some control in their atmosphere, and students saw increases in academic achievement [19]. After receiving training, teachers intended classroom movements in self-concept, achievement motivation, realistic goal setting, and the origin-pawn concept. Specific goals for the students were to be able to determine goals for self, classify strengths and weaknesses, determine the deed to take toward goals, and to tell if the action is leading toward a goal. Stipek (1993) [20] recommend the use of learning centers in the classroom to provide somewhere to stay for the need for classroom conference, individualization of work, and the chance for students to have choices. Even though learning centers have conventionally been used with younger children, they can be used effectively with students of all ages. Another way to structure the classroom to promote intrinsic motivation is through the use of interactive journals [20]. At what time plunder are given, children don't perceive themselves in control of learning, they approach and complete tasks differently than when rewards are not prearranged, and their work is judge as less creative [12,7,17]. Repeated failures in school cause them to build barriers to protect themselves, and therefore they become uninvolved in school [21]. Rewards, then, should be replaced with teaching that is focused on the built-in incentive of the student. A widespread goal should be to have the student's attention be at the center of their knowledge, not a reward. Students who are taught to perceive themselves as causal agent in the classroom fit into place in more risk-taking behavior and amplify their accomplishment [19]. Also, students who make a distinction themselves as more in control of learning have better self-esteem [17].

Characteristics of teacher in Intrinsic Motivation in Mathematics Education

Teachers typically describe high-quality learner as hardworking, interested, and motivated [13]. Motivation is a word heard over and over again as crucial to a child's learning and is often heard as being a major problem in schools today. Two types of motivation, intrinsic and extrinsic incentive, have been documented by [9,10]. Decide scribes an intrinsically aggravated person as one who engages in a hullabaloo for the activity itself; the reward being the activity. A child who cleans his room for the purpose of displaying his baseball card collection is said to be fundamentally motivated. Extrinsic incentive occurs when a person completes an activity because it leads to the acceptance

of an outside reward. A child who is promised a journey to the movies after cleaning his room is said to be extrinsically motivated. While the majority of rewards given in school can be thought of as extrinsic motivators, children learn the most when guided by intrinsic enthusiasm. Children who are intrinsically motivated display number of behaviors that allow them to perform accordingly with their academic abilities [13]. For example, children who are intrinsically motivated become deeply involved in the task at hand and experience a feeling of enjoyment [12]. And seek out challenges with the intention of conquering them (Adelman and Taylor, 1990). According to De Charms [19]. An intrinsically annoyed person feels that he can try to produce a change in the environment and feels confident that the alter will occur. Children seen demonstrating this individuality in the classroom would be characterize as motivated, good students. Children with knowledge disabilities also benefit from intrinsic inspiration. These children tend to work longer and harder on tasks than extrinsically motivated children with learning disabilities (Haywood, 1968), and have been open to the elements to establish critical interior systems of self-reward and mastery goals (Harter 1978). Children exhibiting high levels of intrinsic motivation can achieve at levels that are higher than predicted by psychological testing [14].

The Effect of Rewards on Learning in Mathematics Education

The field of study on motivation was also going away through an assortment of changes beginning in the 1950's. Motivation researchers and dissonance theorists began to reject Freud's contemplation that man is motivated only by drives and instincts [8]. Sallow went on to explain that motivation is man's effort to change his environment, and then feel satisfied when the desired alter occurs. This opinion, along with recognition of intrinsic and extrinsic encouragement lead to the completion of many investigate studies on the effects of enthusiasm on concert [21]. As a result, the idea began to materialize that extrinsic motivators may have a downbeat end item for consumption on a person's internal motivation. Since many of the rewards given in school are extrinsic motivators, school become the setting for a large body of research. During the last 50 years researchers have methodically investigated the effects of rewards on all aspects of school [8]. Establish that the imbursement of money to college students to lie about enjoying a dull learning task did little to change the student's opinion of the task. In the same way [9,10]. Discovered that money as a reward has detrimental effects on motivation. Intrinsically motivated college students become less motivated when paid money as a reward. On the other hand, when fundamentally aggravated students were given praise as a reward, their motivation was enhanced. In addition, in 1972 Deci found that at what time a human being perceives a reward to be more that what is warranted for a given situation, the person puts forth supplementary effort in an activity. The type and enormity of a reward have an effect on motivation and arrangement. The timing

of a reward also affects inspiration. In a study done at a nursery school [15]. Assigned 51 children with a high interest in drawing to one of three experimental conditions. One group of students agreed to absolute a drawing activity for a reward of a certificate and star, one group completed the drawing activity and then received a surprise reward, and the third group completed the activity but acknowledged no reward. The authors then studied the amount of time subjects spent with the drawing supplies during free choice time. Lepper et al. found that the subject who received no award or an unanticipated reward spent significantly more time drawing than subjects in the expected award condition. Rewards contracted for proceeding to an activity begins appearing to chip away at interest in that activity later on, since students in the unforeseen reward condition motionless spent substantial time drawing during free time. In adding together to the type, quantity, and time of a reward, researchers also studied the effect of plunder on the procedure of knowledge.

The importance of Science and Mathematics Subjects

All subject are necessary for learner and educator, but mathematics instruction serve a universal principle of school to enlarge person being emotionally, vigorous, and physically. It make people creative and accountable [22]. Mathematics education enables learner to congregate society difficulty for adequately qualified and flexible or pliable occupation force. For some scientists' ethnos mathematics meant to bring, classified in sequence of math (knowledge and the mathematical practice of cultural assemblage of people) to school. From time this issue has been confused with cultural or indigenous mathematics [23]. In South Africa the idea of ethnomathematics bring ethnic and impartial tension. Students' background in the classroom causes inequalities. Whites claimed that they have more ability to learn math than black because, new technology is the result of their innovation. They accept that mathematic is a new and foreign verbal communication to every single one student before they go to school. Students on or after the beginning are one and the same to learn this completely innovative knowledge which is called ethno mathematics. Currently, the world is becoming more and more technical and the study of science and mathematics is becoming highly valued. Sustainable success in global economy demands workers with advanced thinking, way of thinking and problem-solving skills [24]. The percentage of women graduate with organic sciences degree has grown from 25% in 1960 to 62% in 2005, whereas only 21% of physical science degrees were awarded to women in 2005. Overall, women comprise 24.8% of computer and mathematical professional, down from 27% in 2006.

Global Discourses on and Experiences of STEM

Experiences from developed countries and emerging economies underscore that increasing the number of high schools, college, and postgraduate students majoring in STEM subjects is critical for sustainable economic development. It is not

uncommon to see most STEM graduates go into STEM jobs and occupations that are among the highest paid and fastest growing. Moreover, at the global level, individuals with STEM degrees who enter STEM careers experience lower unemployment rates compared to workers who enter other fields, which means that STEM workers enjoy greater job security. In other cases, students who study STEM can enter a variety of fields and earn a salary premium, even when they pursue non-STME occupations. In turn, STEM education boosts countries' competitive edge and innovative capacity, both of which sustain economic growth (Japan International Cooperation Agency [23,24].

STEM in Ethiopia

The Ethiopian education system consists of two cycles of primary education; two years of general secondary education; followed by either a university preparatory program or technical vocational education and training (TVET). Mathematics is offered separately all the way from kindergarten through secondary school, and science is given as environmental science (integrated form) in the first cycle of primary (Grades 1 to 4). It is further offered as integrated science in Grades 5 and 6 and separately as biology, chemistry, and physics thereafter. Ethiopia offers early specialization, offering courses in biology, chemistry, and physics starting from Grade 7. Thereafter, students' study STM and related subjects, including physical, mathematical, and engineering science; life science and health; teaching, business and economics; and other related fields [23,24]. In addition, recently the Ethiopian government placed special emphasis on science, technology, engineering, and mathematics education. One example of this is the setting of the target of a 70:30 enrolment mix, where 70% of students enrolled should be in science and technology and 30% in social sciences. In addition, the government has established the Centre for Strengthening Mathematics and Science Education in Ethiopia (CSMASEE) under the federal MoE, which is responsible for science and mathematics education across the sector. Ethiopia's membership in SMASE-Africa, a regional association where African countries exchange skills, experiences and issues in teacher education in mathematics and science, which it joined in 2007, later evolved into more collaboration between Ethiopia and the Japanese government, which led to the launch of the CSMASEE (Japan International Cooperation Agency [23,24].

Gender-Sensitive approaches

Gender Differences in Achievements of Mathematics

Near the beginning findings show that girls be inclined to have more unenthusiastic attitudes towards mathematics than boys do, and those attitudes tend to become more unconstructive as pupils moves from basic to secondary school [25]. The wide-ranging attitude of the class towards mathematics associated to the pre-eminence of tuition and social, psychosomatic weather of the class and to increase encouraging attitudes needs individual effort and mathematics nervousness can concentrate

from end to last part systematic destination. However, recent confirmation suggested that collaborative approaches could promote positive attitude among students. Furthermore, attitude actions require considerable cleansing [25]. Distinguish two elemental approaches to illustrate attitude towards math: First a simple definition explain it as the degree of effect associated with mathematics that is Attitude is the emotional disposition towards mathematics. The after that was three constituent definition distinguishes emotional reply, think and behaviors as constituent of come within reach of [25]. Report that mathematics self-assurance, attitude towards mathematics, emotional Stacey found that students with heartening attitude towards mathematics steps forward to more authoritative behavioral and residential theoretical understanding. For short term trends at fourth grade, 41 countries had similar data from 2011 that can be compared to 2015. In mathematics, about half of these countries (21) had higher standard achievement in 2015 than 2011, and another 15 remained at 2011 levels. Only five countries had lower achievement in 2015 [26]. Thorough importance on capacity development that is gender sensitive. In some cases this involves capacity development activities that appreciate the different needs and capacities of men and women, while in other cases the emphasis is on providing specific opportunities for women, in recognition of the enormous participation and agency of women in global access to key resources and services. Of the 36 countries participating in the science part of the TIMSS 2007 at grade 4, significant gender differences favoring boys were found in 8 countries; gender differences favoring girls were found in 6. It is of special importance to note that the advantage of boys in math, even at an early stage grade 4, is highly correlated with advantage in science. Of the 8 countries, where significant gender differences favoring boys were found among grade 4 science students, 7 were also in the 12-country list with significant gender differences in mathematics. Of the 6 countries where girls scored higher than boys in science in grade 4, 4 – Armenia, Qatar, Tunisia and Kuwait – also had gender differences favoring girls among 4th graders in mathematics (ibid).

In grade 8 significant gender differences favoring boys were found in 8 countries [27]. Five of the 16 countries with 20-year trends raised mathematics achievement across their entire eighth grade distribution, with increased percentages of students at all four international benchmarks. Among the 16 countries, the number of improving countries increased at each higher benchmark 5 at Low, 6 at Intermediate, 8 at High, and 10 at highly developed [26]. A sexual characteristics toolkit developed with partners has been taken up widely to build this knowledge, and apply it directly in capacity development activities, working closely with key partners. Gender compassion will be built into the design of capacity development actions. For example, the content and arrangement of farming recommendation provided through advisory services will be adjusted to accommodate preferences of women and of women within can be gender transformative by improving control of resources and participation in decision-

making. Current evidence will be synthesized, and new knowledge and evidence will be generated to inform investment, design, and implementation of these services [26]. Based on research from 1914 through 2011 that spanned more than 30 countries, the study found the differences in grades between girls and boys were largest for language courses and smallest for math and science. The female advantage in school performance in math and science did not become apparent until junior or middle school, according to the study, published in the APA journal Psychological Bulletin. The degree of gender disparity in grades increased from elementary to middle school but decreased between high school and college [28]. Similar to the findings our consequences put it to somebody that for in cooperation boys and girls, math grades fall over the course of junior high and high school [29]. The previous studies that focused on students' science administration from using 1998-1999 ECLS-K data, Kohlhaas and her colleagues found that gender difference started as near the beginning as in the third grade with male students having higher science average mean scores than the female students. In fifth grade, male students still had better performance in science than females [30].

Gender Differences in Achievements of Science

In attendance are lots of factors that affect girl's math accomplishment in poles apart society. These factors can be parents' environment, and parental hold up, enlightening issue, learners' socioeconomic circumstance, and learners' self-possession that may have an effect on their expectation's achievement in math. Mathematics has been easier whispered than done area under conversation for countless students to productively learn. Female students' completion in math is a far and wide recognized as a national awkwardness [31-37]. The comprehensive, information show sexual characteristics differentiation in math accomplishment. Grade 4 science important gender difference favoring girls were establish in the TIMSS 2007 in 10 countries 5 of which were Muslim: Algeria, Kazakhstan, Kuwait, Qatar and Tunisia while Grade 8 science, significant sexual characteristics differences favoring girls were set up only in 4 country – all Muslim: Bahrain, Kuwait, Qatar and Turkey [38-46]. In eighth grade science, Singapore had the best presentation at the TIMSS intercontinental benchmark, with 42 percent of students reaching the Advanced Benchmark, followed by Chinese Taipei (27%) and Japan (24%). In these countries, 86 percent or more reached the Intermediate Benchmark [26].

Do Gender differences Increase with Age?

In science, more than one-third of the countries (17 of 41) had advanced achievement in 2015, 16 remain at 2011 levels, and 8 had lower achievement in 2015. There were comparable levels of short term improvement at eighth grade, with more than half the countries (18 out of 34) showing improvement in mathematics compare to 2011 and only 3 declining, and 15 out of 34 countries presentation enhancement in science and only 4 declining [26]. In 2007, gender difference favoring boys were found in 12 countries

among 4 grade students in mathematics, but only in 8 countries in the midst of 8 grade [26]. A to some degree different picture was found in the science part of the TIMSS 2007: in 8 countries sexual characteristics differences favor boys were found in the middle of 4 grade students; in grade 8 the number increased to [25]. It is of special importance to note, that most countries where sexual category difference favoring boys exist in grade 4 did not formulate obvious to be able to close them in grade 8. what's more, in most cases these gender differences became superior in grade [27].

Conclusion

Motivation is almost certainly the most significant thing that educator can be objective to get better learning. Plentiful irritated punitive conjectures have been postulated to explain motivation. At the same time as each of these theories has several genuineness, no on its own theory seems to sufficiently explain all human motivation. The in sequence is that human beings in all-purpose and students in scrupulous are multifaceted creature with multifaceted requirements and desires. About student, very diminutive if any sophistication can occur unless students are motivated on a consistent basis. The explanation feature impacting student stimuli are: student, teacher, content, method/process, and environment. From the examination the subsequent findings were obtained. More than a few reviews had done on relationship connecting students' attitude and students' show in mathematics and these studies show there was constructive relationship between the two. For this reason, students' attitude towards mathematics is a chief issue that might heaviness the presentation of the student. The inclination psychotherapy in mathematics and science based on the literature review and discussion made it is over and through with that mathematics and science achievement score sex dissimilarity (for males and females) was not get hold of for mathematics and discipline achievement scores. The effect of sex in these variables appears to non about mathematics and science achievement scores among students at primary schools. About differences in mathematics and science achievement score among students, due to location of the schools, the findings obtained disclosed that student's score were postponed significantly. The difference between town and rustic schools was also important.

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