Mathematics Learning: Misconceptions, Problems and Methods of Making Mathematics Learning Fun

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ABSTRACT

This article is related to the fallacy regarding learning mathematics in the current situation of school-level education. The article aims to dig out the meaning of learning mathematics, misconceptions, problems, and the particular ways of making mathematics learning fun in basic level school mathematics. The study is mainly based on the critical review of different related literature. Also, the in-depth interview with the basic level school teachers regarding the problem in learning mathematics, misconceptions about learning mathematics, and the approaches used to make mathematics learning effective and interesting were used to make the result more appropriate. Thus, the study utilized the systematic-descriptive approach combining the result of the different kinds of related literature and the concerned teachers' views and their experiences about mathematics learning problems, misconceptions, and ways to make mathematics learning enjoyable. This article presents the prevailing context of mathematics learning, major misconceptions about mathematics learning, problems of mathematics learning, and ways to make mathematics learning fun. It ascertains the major mathematics learning problems based on three aspects curriculum, teachers, and the students. Also, it helps to deal with misconceptions about learning mathematics by utilizing the most effective intervention techniques.

Keywords: *Mindset, Mathematics learning fun, Mathematics learning problem, Mathematics learning, Misconceptions.*

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Highlights of this paper

- This study presents the meaning of learning mathematics, major misconceptions, problems of learning mathematics, and the ways to make mathematics learning fun at basic level school mathematics.
- It properly guides the teacher to implement the proper instructional strategies to deliver appropriate procedural skills for a better conceptual understanding of learning mathematics.

1. INTRODUCTION

Mathematics learning is essential for every person to handle their day-to-day life. Mathematics learning through utilizing all aspects of development such as physical, social, intellectual, and emotional development can maximize the learners' exposure to mathematical concepts and problem-solving capacities (Abramovich, Grinshpan, & Milligan, 2019). Mathematics is considered by a large number of students as an extremely complex subject to study (Capuno et al., 2019) and also a huge number of students are struggling to comprehend the subject (Mazana, Montero, & Casmir, 2020). Etymologically, the word 'mathematics' originated from the Greek word manthanein, meaning "to learn" or mathema, meaning "learned" and came to have the narrower as well with the more practical meaning 'mathematical study' even in classical times (Roy, 2011). Mathematics learning can help people to improve their mental ability and increase thinking logically while planning and organizing different ideas. The proper knowledge and understanding of mathematics are very important for each individual which helps to apply and integrate the basic ideas into other various disciplines. The knowledge and skills of mathematics enable the students to perform better and make them able to solve problems in different contexts (Gafoor & Kurukkan, 2015). Due to its importance, we are utilizing mathematical concepts, skills, and their application in our daily life without realizing it. Knowingly or unknowingly, children are being forced to learn mathematics through rote memorization to understand mathematical concepts so that they are unable to solve particular problems at a higher level due to poor grasping of basic math facts and concepts. Such a learning process also increases negative attitudes toward learning mathematics and accordingly they have a tendency to hate mathematics (Capuno et al., 2019). A negative attitude hampers successful learning and accordingly affects the learning outcome hereafter performance (Joseph, 2013). So, developing a positive attitude toward the student is necessary for a mathematics teacher for learning mathematics effectively. Also, mathematics teachers should be alert to the use of more competent strategies in teaching that assist the learner to believe, perceive and study mathematics effectively in a joyful environment. Such a learning environment helps to develop positive effects, interest, expectations, and higher self-efficacy toward learning mathematics (Gafoor & Kurukkan, 2015).

The misconception is the preconceived notion that everyone is not capable of learning mathematics. Such misunderstanding about mathematics always makes the learner upset, annoyed, and passive. Hence, it is necessary to address the predetermined notion and should make them energize and spark their interest to learn mathematics using different approaches related to social cognitive learning theory that posits the occurrence of learning through the interaction of person, environment, and behavior. In this theory, observation, interaction, and modeling process help to shape the learners' misconceptions about mathematics learning and their learning problems. The misconceptions about mathematics learning always hold back the students' cognitive development (Kusmaryono, Basir, & Saputro, 2020). Misconceptions toward mathematics learning can be developed through various sources such as parents, school seniors and peers, school teachers, cultural practices and beliefs, etc. Most of the students have good ideas about mathematical terms, but they have some difficulty expressing them correctly (Geary, 2004; Hornigold, 2015; Sharma, 2020). Some students have the wrong conceptual understanding as well as procedural skills. Accurate conceptual knowledge is necessary to develop the proper procedural skills in solving a mathematical

problem. Proper conceptual knowledge helps to encode the problem correctly (Ubi & Odiong, 2018). This problem always creates not only for solving mathematical problems but also hinders mastery of procedural skills.

On the other hand, high prior knowledge and conceptual understanding always help to identify, explain, and correct the errors that occur in learning mathematics (Heemsoth & Heinze, 2014). Thus it is necessary to encourage and cultivate the actual concept and procedural skills regarding mathematical terms and problems in real-time. In the beginning stage, students embrace various faulty conceptual understandings or misconceptions at different points regarding the mathematics learning process (McDonald, 2014; Ubi & Odiong, 2018). Such misconceptions and mathematics learning difficulties can be problematic for the student to develop their learning potentiality and success. As a result, faulty concepts and notion make failure in learning mathematics and create a negative attitude toward learning mathematics (Kunwar & Sharma, 2020). Therefore, timely detection of such misconceptions and providing proper strategy and guidance to address their mathematics learning difficulties is a must essential task of the teacher. Student mathematics learning problems and misconceptions can be addressed by combining different workout examples, self-explanation, and learning from errors. It can help the learner to observe, compare and resolve their belief and reality in the actual learning environment. This study suggests the major types of misconceptions, mathematics learning problems, and alternative approaches that can be used to make mathematics learning enjoyable.

1.1 Context

In the present situation, in the federal government system, three are three governing levels: the local government, provincial government, and federal government. The school education system is particularly, governed by the local level government; however, the school-level curriculum policy and framework have been designed by the federal government. Only a small part of the basic level curriculum has been designed by the local level authority. The implementation of the curriculum such as supervision and monitoring of the pedagogical practices has been done by the local government. Most of the basic level school teachers have got basic level training in general; however, they have not got any special teacher training regarding teaching mathematics. On the other hand, the result of mathematics subjects in different grades of school level and the Secondary Education Examination (SEE) has been found very low (ERO, 2018). According to the report of ERO (2018) the mean achievement score of private schools is 57% and in public schools in mathematics is 26%. The scenario indicates that a large number of students are at the level of low performance particularly, in mathematics (ERO, 2019) and the achievement scores of the student in mathematics are in decreasing trends for some years. The majority of schools in Nepal are operating based on the management and fund of the government, however, a few schools are also operating on the fund and management of the private and public sectors based on the curriculum recommended by the Nepal government (MoE, 2016).

The government of Nepal has launched the National Education Policy-2019. The policy's vision has aim to develop Nepal as an educational hub integrating the slogan of civilized, 'educated, healthy and proficient human resources providing world-class education. It has the aim to develop quality human resources to fulfill the need of the nation by employing competitive, employment-intensive, technology-friendly, and productive education at the entire level of education. Also, the policy has highlighted the accomplishment of a professional degree after carrying out the academic degree to make qualified as well as self-motivated teachers to establish social justice, transformation, and prosperity in the country. However, the impact of this policy on education and social transformation has not been realized yet. The teacher needs to have adequate content as well as pedagogical knowledge about mathematics to carry out in the classroom context to make mathematics learning effective and

interesting (Kunwar, 2019). The use of information communication technology (ICT) encourages the learners to learn and also inspires them to attain and enhance their mathematical concepts and skills (Al-Harbi, 2014) however, there are numerous challenges concerning the use of ICT in classroom teaching in Nepal (Khanal, Joshi, Adhikari, Khadka, & Bishowkarma, 2022). In this regard, some changes have occurred in teachers' beliefs about the effectiveness of ICT in teaching mathematics; however, the conventional approach to classroom delivery is still in practice (Kunwar, Shrestha, & Phuyal, 2022).

1.2. Objectives of the Study

The objectives of the study are as follows:

i) To dig out the meaning and misconceptions of mathematics learning.

ii)To carry out the approaches of executing mathematics learning fun at the basic level students.

2. METHODOLOGY

2.1. Research Design

This study is mainly based on a review of different related literature. However, to make it more convenient for Nepalese school classroom practice, it was also aligned with the teachers' experiences regarding the problems in learning mathematics, student misconceptions about learning mathematics, and appropriate teaching strategies that can be applied to make learning mathematics enjoyable using an in-depth interview with different basic level school class teachers of Province 1. The main themes abstracted from the teachers' interview and the concerning literature regarding the problem have been compared and merged to draw out the problem of learning mathematics, misconceptions, and approaches to make mathematics learning enjoyable. Thus, the research findings that are described are based on the results of systematic observations (Creswell, 2014) of both literature and views of the basic level school teachers. Particularly, the major encouraging and positive practices in teaching mathematics regarding classroom management and approaches used in classroom teaching to make mathematics enjoyable were taken as the key sources in this study.

2.2. Participants

In this study, 10 basic level school teachers teaching up to grade 8 were selected as the participants. All the participants were chosen purposively, the teacher was chosen from the different schools located in the Jhapa district of Province, 1, Nepal. The study was conducted in the mid of April 2022. The teachers have had teaching experiences in primary schools for 3 to 28 years with a minimum qualification of intermediate in education to master degree in education. Detailed information about the participants has been given in Table 1.

Table 1. Participants details.

Participants	Age	Gender	Teaching experience	Educational Qualifications
A	28 Yrs.	Male	3 Yrs.	M Ed.
B	37 Yrs.	Male	16 Yrs.	B Ed.
C	58 Yrs.	Female	28 Yrs.	I Ed.
D	40 Yrs.	Female	18 Yrs.	B Ed.
E	51 Yrs.	Male	25 Yrs.	B A/B Ed.
F	45 Yrs.	Male	20 Yrs.	M Ed.
G	36 Yrs.	Female	12 Yrs.	B A/B Ed.
H	31 Yrs.	Male	11 Yrs.	B Ed.
I	28 Yrs.	Female	6 Yrs.	B Ed.
J	27 Yrs.	Male	4 Yrs.	B Ed.

2.3. Procedure

In this study, the review of the related literature was completed at the beginning of the study. It is mainly based on a review of the literature. However, it was also focused on the actual practices in the classroom setting and the experiences of the teacher in the related field. The investigator conducted in-depth interviews with the participants individually concerning the students' mathematics learning problems, misconceptions about learning mathematics, and the best approaches used to make mathematics learning joyful. In this process, three questions were asked to the participants to explore in-depth views, feelings, and experiences such as i) What are the conditions to occur mathematics learning problems to the students? ii) What types of misconceptions in mathematics do you have observed from your students? iii) What teaching approaches can be used as the best for the students to make learning more interesting and joyful? The view of each participant was recorded and finally, the key points of their views were noted down to align with the previously reviewed literature. Thus, the categories and major types of misconception, mathematics learning problems, and the appropriate teaching approaches to make mathematics learning fun were synthesized and merged to make it more reliable and valid with regard to the reviewed literature.

3. RESULTS AND DISCUSSION

3.1. Mathematics Learning

Mathematics learning can be defined as the attainment of new knowledge, skills, and attitudes that is related to numbers, space, and structure. It is related to the basic action and perception of the learners due to their activities and experiences in and out of school based on the systematic operation of numbers, space, and patterns (Verschaffel, Van Dooren, & De Smedt, 2012). Mathematics can also be learned informally while performing the day-to-day task; however, it is difficult to learn abstract mathematics that does not connect to their daily life. Thus mathematics learning can be referred to as formal academic and informal. Formal mathematics learning is the academic study of numbers, space, and structure to find out patterns, formulate new conjectures, and establish the truth by precise deduction from properly chosen axioms and definitions learned at school (Verschaffel et al., 2012). Informal mathematics involves different human practices about the number, space, and patterns related to their activities such as counting, measuring, locating, designing, and playing. Nowadays mathematics learning is considered an interdisciplinary field due to its application in various disciplines.

Mathematics learning or cognition can be categorized into three different schools of thought namely, behaviorist/empiricist, cognitive/rationalist, constructivist, and pragmatist.Behaviorist/empiricist thought emphasizes the association of stimulus and response that an organism can acquire mathematical knowledge and skills through associations and reinforcement can strengthen the behavior (Ertmer & Newby, 2013). Mathematics learning focuses on drill and practice which is still used in instructional practices. The cognitivist/rationalist thought focuses on information processing. They believe knowledge acquisition is a mental process and it depends upon how the organism receives information, organizes, stores retrieves, and structures (Ertmer & Newby, 2013). The focus is on the active participation of the learner and the learning environment that facilitate mathematics learning (Verschaffel et al., 2012). The pragmatist thought comprises ethnography, anthropology, and situation theory. This thought holds the entire theories that are helpful for learning mathematics by reorganizing activities that come with the integration of the learner into a community of practice (Verschaffel et al., 2012). This thought focuses that mathematical learning is performed by interacting with social and cultural contexts. It is not a universal knowledge system and mathematics differs according to the social and cultural context. Constructivist thought emphasizes the construction of meaning from individual experience. It is also regarded as a branch of

cognitivism, however, constructivism is considered as the filtration of intellect input from the world to produce its unique reality (Jonassen, 1991). They stress learner and environmental factors that are critical to creating knowledge through interaction (Ertmer & Newby, 2013). They claim that the behavior of an organism is determined by the situation and learning occurs in realistic settings and the students' lived experiences.

Mathematical learning is not a one-dimensional phenomenon. There are several factors that affect learning mathematics. Only one school of thought can be used in teaching and learning mathematics. So, learning mathematics depends on the context, nature of the content, prerequisite knowledge, teaching-learning strategies, and activities concerning the different schools of thought (Atteh, 2020). According to Treffers (1987) mathematics learning starts from the study of phenomena in a realistic learning environment guided by the five interconnected principles: (a) it is a constructive activity; (b) making progress toward higher levels of pensiveness; (c) it encourages students' free creation and reflection; (d) learning occurs by cooperation and social interaction; and (e) interconnects components of knowledge and skills. Thus, mathematics learning consists of several factors that are embedded in the context of the learner beyond the classroom, teacher's delivering skills, students' independent learning, interaction, and collaboration.

3.2. Problems of Learning Mathematics

Problems in learning mathematics may be caused by different factors related to the curriculum, teachers, and learners. Learners' negative perceptions toward mathematics due to a sense of fear and failure can generate problems in learning mathematics (Kunwar, 2021). Similarly, the lack of effective instructional practices as well as student support considering their individual needs can also create mathematics learning problems (Causarano, 2015). Also, the improper organization of the subject matter or curriculum can create differences in each of the learners (Kunwar, 2021). The problem regarding the teachers' factor is related to the teachers' knowledge and experience, and skills in utilizing proper methods, tools, and techniques in pedagogical practices. Such problems can be addressed by providing teachers with professional development training. Similarly, learners, related difficulties can be overcome by small extra support and suitable intervention (Geary, 2004; Kunwar & Sharma, 2020). Such problems can be addressed permanently by the proper utilization of content knowledge and pedagogy. Thus, the problems of learning mathematics can be divided into two parts viz. common learning problems and specific problems.

The common learning problems that may occur to the learner are due to the absence of basic conceptual knowledge, ineffective teaching, disappointing curriculum, inadequate learning materials, lack of practice, and inappropriate assessment. Such learning problems generally may occur to each student and can be overcome by addressing these problems. Students may have to face mathematics learning difficulties due to the low level of knowledge regarding basic number facts, concepts, symbols, and procedures which are the building blocks for learning mathematics and are also necessary for solving more complex concepts and problems (Scherer, Beswick, DeBlois, Healy, & Moser, 2017). This type of mathematics learning difficulty is considered situational and not common although situated outer surface of the child and consequences from particular causes such as physical, emotional, educational, or environmental (Kunwar & Sharma, 2020).

Specific learning problems occur in some particular students who have suffered from various mathematics learning deficits or neuropsychological deficits (Geary, 2004; Sharma, 2020). Such learning problems cannot be cured completely such as dyscalculia, dyslexia, dysgraphia, attention disorder, etc. It is known as a learning problem related to a mathematics learning disability (Geary, 2004; Hornigold, 2015). This type of learning problem is situated on the learner themselves as the learning disability is located in their cognitive development (Kunwar &

Sharma, 2020). Such types of learning difficulties are considered as serious and need to address through effective teaching and interference beyond the prevailing classroom teaching to improve their performance in mathematics (Sharma, 2020). Such problems can be described as multiple types of deficits in mathematical skills, particularly, in the domain of numeric and arithmetical problem solving (Karagiannakis, Baccaglini-Frank, & Papadatos, 2014). Since it arises due to inherited and neurological discrepancies in the structure of the brain and function and influences the ability of an individual in receiving, store, process, retrieve, or communicate information (Soares, Evans, & Patel, 2018). Such mathematics learning difficulty requires particular instruction with intervention to defeat the difficulties that may go beyond the prevailing mathematics teaching and learning (Kunwar & Sharma, 2020). The interventions given to such mathematics learning difficulty should be effective, efficient, graceful, and derived from appropriate principles of learning mathematics that reflect the difficulty and concentrate on the practice for delivering expected outcomes (Sharma, 2020).

3.3. Misconceptions about Learning Mathematics

Misconceptions about learning mathematics can embrace a student back from effectively learning mathematics and doing mathematics well. A misconception is, basically, a deficient understanding of learning mathematics developed from saying of peers, parents, and teachers and deficient performance (Mabena, Mokgosi, & Ramapela, 2021). Misconceptions are also a common misunderstanding as in any other phenomenon of real-life conditions (McDonald, 2010). It is regarded in any concepts of mathematics belonging to the way of teaching and the condition of the learner that how the concept has been taught and what is the condition of the learner to grasp the concept. It may also create by previous inadequate knowledge regarding mathematics, faulty, inaccurate, and incorrect thinking, or poor memory of the learner that causes trouble in grasping mathematics (Scherer et al., 2017). It can also form by attempting difficult and abstract mathematical problems when the learner found some mistakes or difficulty in procedural or conceptual parts in a new situation using prior knowledge. Misconceptions about learning mathematics create not only to succeeding in mathematics, but also create frustration, anxiety, and a negative attitude toward learning mathematics (Belbase, 2013). Misconceptions are not just an error. The error can occur sometimes due to any mistake, but misconception occurs regularly due to an inaccurate and incorrect understanding of prior knowledge (McDonald, 2010). There are several factors that create misconceptions about learning mathematics.

Misconceptions about learning mathematics can be categorized into three parts depending on their characteristics namely: preconceived notions, conceptual misunderstanding, and age and gender-related misconceptions. The idea or belief that is formed earlier or before studying the subject matter without adequate evidence and knowledge is the preconceived misconception. This type of misconception can develop by listening to elders and others and affect the learner in the beginning stages of learning mathematics. For example- mathematics is very hard, it is for males, it is for math-minded people, it requires innate power, mathematics is about memorization, etc. Conceptual misunderstanding is an idea or opinion about the term or the subject matter that is wrong or faulty due to an incorrect personal experience or thinking. It always happens due to the erroneous experience or understanding of the learner. This type of misunderstanding may occur while calculating numerical problems and solving verbal problems. The misconception that is mainly concerned with the learners' age and gender is age and gender-related misconception. Generally, it is considered that girls by gender and young age people cannot learn complex mathematics concepts. Some of the common misconceptions that frequently appear in learning mathematics and also hinder classroom practice are discussed in brief.

3.3.1. Mathematics is only for Math Minded People

It is a belief that some people with math minded can only learn mathematics. They think that it is very difficult and we are not math-minded people which leads to poor self-confidence and self-motivation towards mathematics (Passolunghi, Caviola, De Agostini, Perin, & Mammarella, 2016). Self-confidence is one of the most contributing factors to mathematical performance. Due to poor self-confidence, most students are lacking to learn mathematics and creating fear and anxiety about mathematics. Thus, such misconceptions about learning mathematics hinder mathematics learners' activities, active participation, and continuing their learning. Gradually, the sense of accomplishment and pride toward learning mathematics decreases and also creates a negative attitude toward learning mathematics.

3.3.2. Mathematics is for Boys

There is a misunderstanding about learning math that only boys have the capabilities of learning mathematics (Beilock, Gunderson, Ramirez, & Levine, 2010). This misconception has been working for some girls students and is lacking to learn mathematics and they think that I could not learn math if I tried. Due to such negative feelings about mathematics, very few students are ready to admit and ready to learn mathematics. But different research report shows that there is no difference between boys and girls in mathematics learning ability. Thus, it is necessary to turn the students' misconceptions and negative attitudes as mathematics is only for boys through utilizing multiple teaching and learning approaches. Similarly, it is also necessary to introduce mentoring programs, especially for girl students, and should increase their participation in mathematics learning.

3.3.3. Everyone Cannot Learn Mathematics

Many people believe that mathematics is not for everyone (Beilock et al., 2010). It requires special memory and learning capacity. Some student thinks that mathematics is reserved for an elite group of students and it is not for us and we cannot do or learn mathematics. Such feeling of the learner has also been working as fear of learning mathematics and creating a negative attitude towards mathematics. It is necessary to convey to the learner that every student is capable of learning mathematics, but they can learn mathematics differently (Sharma, 2020). So, the learning environment should be created as per the need of the learner need and interest in a joyful environment.

3.3.4. Mathematics in not Fun and Creative

Many students have misinformation about mathematics that it is not fun and creative and they do not pay enough attention to learning mathematics. They only think as it is too boring and tedious subject and lose their self-confidence (Roy, 2011). Learning mathematics is a more attentive process and requires continuous effort; however, it is also a fun and creative subject (Afari, 2012). Effective learning of mathematics depends on the teaching strategies and learning environment and the use of appropriate materials that makes learning fun. Mathematics learning can make fun and creative through play, games, and different mathematical applications.

3.4. Methods of Making Learning Mathematics Fun

Mathematics is considered a difficult and boring subject; however, it has a greater significance in each activity of the human being. Thus, the importance of mathematics has been growing day by day. The wide spared use of technology has been making mathematics more useful and mathematics learning fun. However, several mathematics learners have anxiety and fear towards learning mathematics which creates a negative attitude toward mathematics (Roy, 2011). As said by Marie Curie, "Nothing in life is to be feared, it is only to be understood, and now is the time

to understand more, so that we may fear less" (Sutton, 2016). Therefore, the fear and anxiety toward mathematics are necessary to weaken and strengthen learning mathematics by creating an environment of learning mathematics fun. The prominent processes for making mathematics learning fun have been discussed below.

3.4.1. Broader Mindset

Mindset is the condition of the mind; a set of beliefs or a state of thought and beliefs that shape our habits. A mindset of an individual always impacts making the sense of the world. There are two types of mindsets: growth mindset and fixed mindset (Dweck, 2006). A person with a growth mindset always thinks positively and believes that intelligence and talent can be developed by effort and learning. They trust their talents and involve in various learning activities to get better results. It is also known as a broad mindset. They always think full of opportunity and success ahead. So, a broader mindset is a key aspect of making positive changes in life and plays a vital role to determine achievement and success (Dweck, 2006). Thus, it is necessary to develop a growth mindset for school children to increase their learning effort and mathematics achievement.

A fixed mindset individual believes as intelligence and talent are already fixed and they always think that learning cannot develop intelligence. It is already fixed and unchanged. People with a fixed mindset consider that their intelligence level and abilities are inherent and fixed and they do not have the inspiration to do more for betterment. According to Dweck (2006) nobody has a permanent mindset, either fixed or growth. However, a fixed mindset triggers the learner toward negative feelings and failure. They always think: "I am weak in mathematics", "it is difficult for me", or "I cannot pass mathematics". In such conditions, the learner can be shifted gradually through generating the proper learning environment such as praising, encouraging, creating self-awareness, self-talk, etc. Encouragement, feedback, process-oriented tasks, and continuous effort with appropriate resources can minimize negative feelings and improve self-realization and hence can develop a broader mindset. Such negative feelings toward learning mathematics should be narrowed down by exemplifying the story of a successor. Also, they should provide sufficient time and continuity for solving problems. Thus, the learner with a fixed mindset could be broadening day by day and gradually they got success in learning mathematics.

3.4.2. Guided Approach

The guided learning approach is used to create independent learners and make them able to share their ideas and opinions in a collaborative way with their pair. In this approach, the teacher plays the role to motivate the students and creating the appropriate learning environment in the classroom. It is a student-centered approach that helps to increase students' creativity and provides explicit guidance to the learners when they counter the challenges beyond their existing level of ability. Thus, this approach supports the learners to tackle various difficulties that occur during their independent practice. It is appropriate for slow learners as well as quick learners to address their needs according to their needs. In this approach, teachers arrange the subject matter and direct the students by submitting questions to reach a generalization (Baker, 2016). This approach provides the guidance of teachers and makes the students solve the problem according to their individual needs and also makes them engage in learning activities. The weak students also get benefit from the teacher's assistance in a small group that makes mathematics easy and interesting. Therefore, the guided approach can help the students learn mathematics fun.

3.4.3. Collaborative Learning

It is a learning that involves working together or working in a small group to ensure the participation of each learner in creating knowledge. It is an umbrella term for a variety of learning approaches. In this learning, students

are working in groups searching for understanding meanings, solutions, or results. In this approach, the groups of students solve the problem with the help of certain clues given by the teacher to solve the problem at hand and they collaborate with each other for the outcome or result. The learners take part actively in the learning process and synthesize concepts and information more willingly than they remember the facts and other mathematical information (Chandra, 2015). It can also be part of the motivation to learn mathematics and make them inspired to engage in a joyful mathematics learning environment. Collaborative learning helps to increase students' participation, engagement, teamwork, and responsibilities in learning mathematics. Therefore, it helps the students to increase a positive attitude towards learning mathematics and decreases the fear and frustration about learning mathematics.

3.4.4. Fun Mathematical Games

The use of mathematical games also helps the students to learn mathematics effectively. Learning mathematics by using mathematical games makes learning interesting, fun, and enjoyable (Afari, 2012). In the lower grade, mathematical games are used as an effective tool for teaching. The use of such games in the classroom may create more energy or inspiration to grasp new mathematical concepts and knowledge and also make enjoyable learning. It engages and encourages students to explore different mathematical concepts such as number combinations, place values, patterns, and other important concepts of mathematics. Mathematical games can also increase the students' positive attitudes towards learning mathematics (Afari, 2012). The integration of games in teaching can facilitate minimizing students' negative attitudes and lead to the development of positive attitudes toward learning (Afari, 2012). So, a mathematical fun game can be considered as a recharger for the learners' brains to keep fit and develop memory power as well.

3.4.5.Modern Technology

Technology is a tool that provides dynamic learning opportunities in a mathematics classroom. It can boost the learning process and make the learning environment live to engage by interactive media. Information Communication Technology (ICT) is a very important motivating tool that can be used to support working with multiple representations, discovery learning, individual learning, practicing, and reflection (Thurm & Barzel, 2022). ICT in education has multiple effects that enhance student learning by providing them with an interactive learning environment. The use of modern technology has contributed to learning by providing the learner with an interactive learning environment. ICT has also made it easy for people, particularly, in remote areas, to gain access to resources by providing an online mode of teaching and learning, minimizing the cost of instruction and time, and facilitating teacher training and seminars for students and teachers (Dhital, 2018). It helps to increase speed, enhances, and strengthens fundamental skills concerning reading, writing, arithmetic, and sciences. Also, it motivates and encourages the students to independent and responsible learners.

The use of modern technology enabled students to learn better by engaging in educational activities greater than ever (Da Rocha Seixas, Gomes, & De Melo Filho, 2016; Pellas, 2014). It makes the mathematics learning process earlier, easier and more fun. It can generate a universal platform for the students and also make available better opportunities to enjoy, play and learn mathematics for special needs children. Therefore, it can be used to enhance the effective implementation and delivery of mathematics learning.

3.4.6. Child-Friendly Learning Environment

Child-friendly learning focuses to provide a safe and enjoyable learning environment to the children. The child-friendly learning emphasizes different perspectives of the learner to ensure self-respect and wellbeing. So, it is a child-seeking, child-centered, inclusive, safe, democratic, and gender-sensitive teaching-learning method. The most commonly used learning theories in the classroom are behaviorism which is based on what the organism does, cognitivism based on what the organism thinks, and constructivism how the organism constructs knowledge (Lessani, Suraya, Bakar, & Khameneh, 2016). Connectivism is the newly developed theory of learning with the development of internet technology for the digital age that can be used effectively to create a child-friendly learning environment. This theory emphasizes the association between the mind of the person and the world outside. Thus, the role of the teacher has shifted from an "expert" or "spoon feeder" to an observer, facilitator, and coordinator in a collaborative learning context (Goldie, 2016). Connectivism focuses on child-friendly learning that consists of the standards of physical characteristics, curriculum, teaching materials, and the condition of human resources (Usman, 2016). This theory provides equal treatment to the learners who have a different background, age, gender, abilities, experiences, and intelligence in a democratic way creating an enjoyable learning environment.

3.4.7. Rapport Building

Rapport building refers to a relationship that exists a mutual trust and understanding among all individuals of a group or class. It is a process of creating a relationship of trust relationships between two or more people. Rapport building consists of the factors relatedness, cooperation, and praise. The friendly relationship between the student and the mathematics teacher is estimated to motivate the students in learning, develop a positive attitude towards mathematics and gradually increase the performance of the students in mathematics. Thus, rapport building of the teacher is necessary for the mathematics teacher. However, some facets such as the personality of the teacher, teaching techniques, attitude, skills to deal with students, problem-solving skills, etc. appear to be accountable to increase and continue the rapport building of the teacher (Acharya, 2017). So the concerned teacher must be always aware, sincere, attentive, smiling, and careful about the students.

3.4.8. Satellite Learning Approach

Mathematics learning is regarded as a difficult subject caused of its abstract nature. Most students face difficulty to learn mathematics. Some of the students cannot express their exact difficulties in learning mathematics to their teacher due to hesitation; however, they can say their actual problems to their pairs. The satellite learning approach is a way of making a smart teacher by choosing from the same group of students those who deserve the knowledge, skills, and abilities of the related subject matter and are able to convey it to their pairs. It is a way to identify the smart students and use them to teach the other remaining groups of students. This approach utilizes the selected students from the class who are excellent at mathematics. Then those selected smart students of mathematics are taught separately by the teacher and asked to teach them to the remaining weak students in the mathematics class. The selected smart students teach the weak students in a small group at a certain time effectively to make them able to know and solve the given task. It is a type of peer teaching that appears to be successful for the weaker student, who gets an opportunity to learn from a friend with no hesitation. This approach encourages the weak student by getting more time to practice and may also feel more comfortable learning from the pair.

4. CONCLUSIONS

The study presents the context of mathematics learning and the status of achievement at basic level schools is discussed. In this situation, curriculum implementation, teacher preparation and training, classroom management and supervision system of basic level school has been governed by the local government. This article has basically been focused on mathematics learning, misconceptions about mathematics, problems of learning mathematics, and the methods of making mathematics learning fun for basic level students. It is particularly, based on the related literature, classroom practices, and views obtained from the related school teachers. The mathematics learning problems have been drawn from the class observation and discussion with the concerned teachers and the students. Also, some considerations regarding making mathematics learning fun are extracted from the views of the teachers and the students. It is concluded that dealing with the misconceptions found in the students and employing the ways to make mathematics learning fun can enhance to develop students' positive attitude toward learning mathematics and also helps to improve mathematics achievement of the students. Additionally, the proper utilization of effective teaching of mathematics also enhances the student participation in learning mathematics and hence increases the motivation and creativity of the students towards mathematics learning and assists them to reduce their anxiety levels of the learners.

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