

Underachieving Students' Mathematical Learning Experience in the Classrooms in Nepal

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Citation: Shrestha, R. D., Luitel, B. C., & Belbase, S. (2021). Underachieving Students' Mathematical Learning Experience in the Classrooms in Nepal. *Contemporary Mathematics and Science Education*, 2(2), ep21010. <https://doi.org/10.30935/conmaths/10944>

ABSTRACT

There is limited evidence of underachieving students' mathematical experiences and the challenges they face in mathematics classes in the context of Nepal. This study explores the lived experiences of underachiever students in learning mathematics in a public school in Kathmandu, Nepal. The study participants were three ninth-grade students (two females and one male) who failed mathematics and repeated the grade. A sequence of in-depth interviews was administered with each participant to explore their lived experience of mathematics. The participants' narratives were constructed based on the temporal sequence of event analysis concerning their mathematics learning experience. Their narratives revealed three critical concerns in their experience of learning mathematics: mathematics is complicated, mathematics is abstract, and mathematics learning is rote memorization. Change of schools was one of the main reasons they had difficulty adjusting to the new environment, affecting their mathematics learning. Another concern they revealed was the obligation to support their parents during the out of school time or even during school time and being frequently absent in the class.

Keywords: underachievers in mathematics, learning mathematics, teaching mathematics, Nepal

Received: 6 Jan. 2021 ♦ Accepted: 17 Feb. 2021

INTRODUCTION

Students' mathematics achievement has been one of the significant concerns in school education in Nepal. The Curriculum Development Center (CDC) of Nepal designed the National Curriculum Framework for the first time in 2007 (CDC, 2007), which was recently revised and implemented as the new National Curriculum Framework for School Education (CDC, 2019). Both of these frameworks have mandated mathematics to be taught as a compulsory subject in grades K-10 and optional in grades 11-12. Despite the concerted efforts to improve school education in general and mathematics education in particular, several students still find mathematics as a subject of low interest in learning. Consequently, they develop a weak background in this subject leading to failure in National Examinations, such as the School Leaving Certificate (SLC) (Mathema & Bista, 2006). A majority of students are not interested in learning mathematics. Teacher's traditional teacher-centered pedagogy is one of the major causes of low motivation and a lack of interest in mathematics (Rawat, 2018).

According to Mathema and Bista (2006), the curriculum should focus on the learning competencies directed towards learning mathematics that is practically applicable to daily life and using mathematical content in everyday life problem-solving. The report shows that the teaching-learning process focuses on memorization without knowing their utility to bring high marks in the examination.

Mathematics learning is not related to the daily life of students. In a study, Heydari, Abdi, and Rostami (2013) reported a significant and negative relationship between mathematics achievement and anxiety. Therefore, the students who have mathematics anxiety develop a negative attitude to this subject and achieve low in mathematics (Belbase, 2013).

According to Bista and Mathema (2006), "Most of the failures in the SLC examination can be attributed to a failure in mathematics" (p. 151). This report shows that the teaching-learning process primarily focused on memorizing mathematical facts and procedures without knowing the concepts and applications. The Ministry of Education (MoE) of Nepal (2014) reported that SLC dropouts face difficulties getting through Mathematics, English, and Science. The failed percentage of the students in mathematics in 2010 was 29.62%. In 2011, it was 38.79%, and in 2012, it was 42.09% (MoE, 2014). It also shows that a large number of students failed in mathematics in the SLC. It concluded that the factors for failing in the SLC examination in Mathematics, English, and Science were poor teaching-learning environment in public schools, lack of qualified and competent teachers, and lack of coaching to support students, and remedial classes for the students, traditional didactic teaching practices, and poor coordination between school teachers, parents, and students.

In this context, the issue of underachievers in mathematics is a significant concern in Nepal. National Assessment of Student

Achievement (NASA) reports of 2012 and 2015 showed that mathematics learning achievement decreased in grades 3 and 5. In grade 3, it decreased from 54 to 49, and in grade 5, it decreased from 53 to 48 (MoE, 2015). This trend in achievement in school mathematics is a critical concern for the stakeholders. It points out the need to work for the betterment of different levels. Since there are many students who failed in mathematics, it is rational to explore why most of the students failed in mathematics and the learning experience of underachievers. Student factors such as “study habits, attitudes, and interests toward mathematics and time management” (Suan, 2014, p. 18) directly affect the performance of students in mathematics. Therefore, the students’ study habits, attitude towards mathematics, interest, and practice directly affect their performance in mathematics. Low achiever students most often seem to be hesitant to ask questions to others. In many cases, “students with low achievement are not always able to ask for the right help because it is difficult for them to explain what they do not understand” (Hoek et al., 1999, as cited in Keijzer & Terwel, 2004, p.11). Help-seeking is very important in academic success for many students (Chowdhury & Halder, 2019). However, most low achievers do not seek help from teachers and others, which may cause a severe disadvantage in their mathematics learning (Ryan et al., 2001).

Generally, when students are in lower grades, they have high confidence in mathematics. There is no particular study in Nepal in this area. Still, there is also a similar condition, as Trends of International Mathematics and Science Studies (TIMSS, 2007) report shows, in European Union countries (Mullis et al., 2008). This report shows that in 4th grade, the girl’s confidence was 61% and boy’s confidence 71%, whereas, in 8th grade, the girl’s confidence was 11% and boy’s confidence 7%. It shows the achievement in mathematics of grades four and eight; students of grade four did better than the students of grade eight (Mullis et al., 2008). When students were in lower grades, they felt it easy to do mathematics, but they felt difficulty and confusion in learning mathematics when talking about higher grades. This view could indicate that their learning experiences may not support their interest and confidence as they went to higher-grade levels. They may end up being underachievers in a higher-grade level.

Underachieving students’ difficulty with mathematics is often connected to mathematics anxiety. According to Sherard (1981), “Many students who have mathematics anxiety admit to having no confidence in their ability to do mathematics, and thus they develop negative attitudes toward mathematics” (p. 107). That means underachievement in mathematics has been attributed to low self-confidence and students’ perception of math anxiety (Brezavšček et al., 2020). Despite the grave concerns of low achievement in mathematics, there is still a lack of studies that explore the underachievers’ lived experience of learning mathematics in Nepal. To fulfill that gap of knowledge in the literature, the purpose of this study is to explore the lived experiences of underachiever students in learning mathematics, especially in Nepal, where many students fail and find mathematics challenging. The research question formulated for the study was: How do underachieving students experience the learning of mathematics? In the next part, we first reviewed some relevant literature for the study. Second, we outlined the methodological part of the study. Third, we presented the results in terms of three participants’ narratives and their stories of mathematical experiences. Finally, we discussed their narratives or stories generating meanings in relation to the literature and theories of learning mathematics.

UNDERACHIEVERS IN MATHEMATICS

The National Council of Teachers of Mathematics (NCTM) has outlined some learning difficulties in mathematics. These characteristics are—slow or inaccurate recalling, impulsiveness in problem-solving, difficulty representing concepts, poor development of number sense, and the problem with their working memory (NCTM, 2007). These characteristics can help identify students’ problems and issues in learning mathematics, especially to those who are low achievers.

There is no universal meaning of underachiever. To put it simply, low/underachievers are those types of students whose position is below the average. In this perspective, Smith (2005) believes that many definitions of underachievement underscore the gap between students’ potential ability and performance or achievement in a particular area. There are many kinds of students in a school-- some perform well, and others may not. Those students are called underachievers who do not perform well or perform below the average in their classes. In this regard, O’Shea (1970) describes that low achievers are those who have weaker achievement and motivation, as having less satisfying family relationships, as being less aggressive, less persistent, and less conforming. Low achievers in terms of underachievers are those students who may perform below average. Still, they may have a high potential to perform high with proper alignment of their interest and learning style (Agaliotis & Kalyva, 2019). That means underachievement can be a product of misalignment of student interest and need to the classroom instruction. Sousa (2003) observes underachievement as behavior and not an attitude or set of work habits. This view reveals that underachievement is the behavior of the students, which they perform during their study. Some students who perform excellent behavior are called talented students, those who perform normal behavior are called the average students, and those who perform un-satisfactory behavior are underachievers (Chukwu-Etu, 2009).

In another sense, the European Commission stated in a report, in Program for International Student Assessment (PISA) of 2012, that low achievers who are not reaching a minimum level of basic skills in mathematics: in the current situation, more than 20% of young Europeans are not reaching a minimum level of basic skills in mathematics (OECD, 2012). It represents that underachievement is a universal problem for every subject, but it appears more in mathematics. It is considered that overachievers tend to be more self-confident, greater motivated, and have a higher capacity for working under pressure. In contrast, underachievers tend to have a greater tendency to procrastinate (Presswood, 2012), to rely upon pressures in completing assignments, and to be more critical of educational methodology and philosophy than the overachievers (Gadzella & Fournet, 1976).

Similarly, Foong and Ee (2002) stated that an underachiever does not achieve his/her potential during the study. Students who performed poorly in mathematics were labeled with slow learners, low attainers, and underachievers. The relationship between the child and the whole learning environment plays a vital role in achieving high in mathematics. The nature of mathematics, language problems, information-processing deficits, motivational problems, and mathematics anxiety may affect mathematics achievement. On the other hand, Bhagat and Chang (2015) categorized high achievers who

score from 75 to 100, average achievers who score from 60 to 74, and low achievers who score below 60 in Mathematics Achievement Test (MAT). Reis and McCoach (2002) describe that underachievement is used to describe a situation where performance is below what is expected based on ability.

Underachievers can be categorized differently as suggested by Mandel and Marcus (1988), who identified six significant types of underachievers: coasting underachievers, anxious underachievers, defiant underachievers, and wheeler-dealer underachievers, identity search underachievers, and sad or depressed underachievers. Many factors play vital roles in underachievement. In this perspective, Sousa (2003) observed that a combination of factors both in the home and at school could cause underachievement (Chukwu-Etu, 2009). Moreover, inadequate understanding and insufficient motivation are vital factors for low achievement (Ryan, 2012). Similarly, research studies show that lack of motivation, parental/home influence, lack of nurturing of intellectual potential, conflict of values, disabilities/poor health condition, life experiences of specific groups of pupils, and inability to recruit and retain highly qualified personnel in schools are some of the causes of underachievement (Chukwu-Etu, 2009).

A recent study by Huijsmans, Kleemans, and van der Ven (2020) examined the learning profiles of students with mathematics learning difficulties (MLD) and typical difficulties (TD) and how they differ in cognitive skills. They identified mathematics learning profiles that can be used to identify specific problems and challenges facing low achieving students. They focused on individual variation, cognitive mechanism, and profiles of performance to model the study. They

found that children with MLD were a small fraction of a larger group of TD-children. The children with weak mathematics learning but average non-verbal reasoning was compared with weak mathematics learning and verbal reasoning. The study results demonstrated that there was no significant difference in their cognitive skills related to mathematics problem-solving. The mathematics learning difficulties had a different nature for MLD and TD-children (Huijsmans et al., 2020).

The literature review on mathematics learning difficulties and underachievement in mathematics showed no unique model for understanding students' problems and challenges in learning mathematics. Their experiences in learning mathematics are unique and contextual. They are influenced not only by their cognitive abilities but also by many other factors, such as social, cultural, historical, pedagogical, and psychological. We utilized these aspects to frame our theoretical framework to understand underachievers' mathematical experiences in the current study.

THEORETICAL FRAMEWORK

Literature in mathematics learning difficulties focuses on cognitive problems as a significant factor for students' inability to perform well (Fuchs et al., 2019). However, the learning difficulties that make some students underachievers can be linked to social, cultural, historical, and pedagogical aspects of mathematics. Therefore, we constructed our framework to understand underachieving students' mathematical experiences from these dimensions (Figure 1).



Figure 1. A Theoretical Framework for the Study

The social aspect focuses on the social dynamics that may affect students' learning mathematics activities within and out of schools. For example, migration from a place to another and frequent change of schools may affect students' orientation to mathematics (Acharya et al., 2021). Cultural aspects are related to how parents and other community members view mathematics in general and school mathematics, particularly how school mathematics is connected or not to the community and culture (Acharya et al., 2021). Their professional connection to academic mathematics in a cultural context can motivate students to learn and make sense of mathematics (Figure 1).

The historical aspects, such as artifacts and constructions in historical sites and their models, can support students understanding of mathematics from contexts. The ancestral or legendary connection of problem-solving in mathematics, such as how parents and grandparents solve mathematical problems or how they used to apply mathematics in life, can help students and teachers make sense of why particular rules and mathematics approaches are more important than others. Both the pedagogical and psychological aspects are associated with teaching and learning mathematics in a meaningful way so that students get motivated and their self-esteem increases (Panthi & Belbase, 2017). We have used these different domains to understand and interpret underachievers' mathematics learning experiences (Figure 1).

RESEARCH METHOD

This qualitative interpretive study explored low-achieving participants' lived experiences in storied forms (Clandinin & Rosiek, 2007). "Narratives (stories) in the human sciences would be defined provisionally as discourses with a clear sequential order connecting events in a meaningful way" (Elliot, 2005, p. 3). This approach focuses on the participants' feelings, emotions, and lived experiences at specific learning moments (Fraser, 2004).

Study Site and Research Participants

Three ninth-grade students (two females and one male) were purposefully selected by the researcher (first author) in a public school in Kathmandu. Participant selection was based on their mathematical background and interest in participating in the study. "It is better to choose the place where anyone can enter easily, or it should be the place where it is possible for anyone to enter" (Maxwell, 1996, p. 54). The three participants were—Diya, Amita, and Raj Kumar (pseudonyms).

Diya was born in a low-income family in the Dadeldhura district of Far-western Nepal. Her family migrated from Dadeldhura to Kathmandu ten years ago. Her parents work on their farm. Diya and her siblings had to help their parents on the tomato farm and look after goats and cows. The next research participant was Amita, who migrated from the Pyuthan district. She grew up in undeveloped rural communities without light, drinking water, and roads. The third research participant was Raj Kumar. His parents came to Kathmandu from a remote village in search of a job. Raj Kumar was born in Kathmandu and grew up with the economic hardships of his parents. All the three research participants had a failing grade in mathematics in the last final year examination and repeated the grade or they had D or E grades in the last terminal examination before the study time. They were identified as low performing students in mathematics based on their grades in the prior grade level final examination in the school. These students were considered cognitively normal in mathematics

learning without any special needs or difficulties regarding physical and psychological conditions. The school had not identified them with any learning difficulties, such as dyscalculia or dyslexia. Their low performance in mathematics was associated with teachers, schools, curricula, and personal characteristics (interest and focus).

Data Construction

After getting consent from the students and their parents, a sequence of in-depth interviews was conducted to explore the participants' lived experiences of learning mathematics in school classrooms. The interviews were conducted with open questions in an informal environment to help participants express their mathematics learning experiences. The researcher administered each interview personally to find out some issues and problems associated with their learning mathematics. The discussions focused on questions on participants' mathematics experiences, like which topic was smooth and hard in mathematics and why? Sometimes, the researcher requested them to write brief notes about which problem was difficult or easy and why? The participants shared their difficulties in learning mathematics, and in some questions, they could not answer immediately.

The interviews were conducted five times with each participant. Multiple interviews were conducted to get more information making it easy for the participants to open up more with their experiential anecdotes through further clarifications and explanations. Each interview was audio-recorded and transcribed for further analysis and interpretation. The researcher (first author) maintained a field diary by keeping note of the central ideas discussed in each interview session. The interview records were transcribed verbatim to construct the experience centered narratives by expanding the contexts and materials (Andrews, Squire, & Tamboukou, 2013).

Data Analysis and Interpretation

The interview transcripts, class observation notes used in the class time to note student activities, and field notes were maintained during the interviews with key ideas discussed with the participants. These sources of information were helpful to analyze the interview data to find the key ideas in terms of the participants' lived/living experience of mathematics. Although the field notes and class observation notes were supportive in the analysis and interpretation of the data, the interview transcripts were critical in identifying the major themes out of participants' learning experiences (Butina, 2015). These observational notes from the classroom were subsidiary to data analysis just to confirm these students were in the class to perform a certain way in mathematics. These observations and field notes helped the first author to come up with questions for the interviews. The class observation and field notes were auxiliary to interview transcript. They were not the primary source of data but complementary to interviews to identify any discrepancy in observations and interviews. Therefore, analysis and interpretation did not mention them because the interviews were the major parts of the data and analyses. Therefore, the major sources of data were the interviews and their transcript. The interview transcripts were read several rounds to identify critical segments or episodes to identify critical incidences. These critical incidences were organized together to construct participants' narratives in a temporal sequence from their experience of learning mathematics from early grades to the current grade and how the moments affected their understanding or learning of mathematics across the grades. Their lived/living experiences of mathematics were interpreted within the theoretical

framework of social, cultural, historical, psychological, and pedagogical contexts.

RESULTS

The study results have been presented in terms of narratives to portray the participants' experience at three layers—early experience, transitional experiences, and recent mathematics learning experience within three thematic structures as mathematics is difficult, abstract, and rote memorization. The explanation of participants' lived/living mathematical experiences are based on their first-person perspective, but not the researchers' interpretive accounts. Therefore, the narratives of the three participants have been presented in the form of their stories either in their first person or in third person perspectives. In the first-person perspective, the participants' voices have been presented within the direct quotations, and in the third-person perspective, their voices have been described in the third person nouns and pronouns.

Diya's Experience

The early experience of mathematics learning. Diya used to speak *Dotel* language (local language) at home and in school in her early grades. Up to the fourth grade, she felt comfortable learning mathematics because, in her village, the teacher used to teach mathematics in the local language, *Dotel*. The mathematics teacher used to teach in the local language; therefore, she did not feel irritated or bored in the mathematics class. She did not feel afraid of making mistakes in the class (in mathematics) because there was no physical or other punishment for such a mistake. Sometimes, the teachers used to visit her home during leisure time. She could ask them mathematics problems when she had difficulty in solving them. At that time, her teachers demonstrated mathematical operations with real objects around to give examples of shapes like a triangle, rectangle, circle, etc.

Diya said,

"When I was young, my uncle taught me the basic concept of mathematics like addition, subtraction, etc. Sometimes, he used oranges for teaching me addition and subtraction. When he was teaching addition, he used to collect the oranges together, and when he was teaching subtraction, he used to separate the oranges. That way, my uncle used to teach me addition and subtraction."

She further added,

"That time, my uncle helped me learn mathematics and there was no need to help in household works, my duty was just read and play games."

At that time, Diya was a little child. Therefore, she did not have to help her parents at home. She could ask for help to solve math problems with the elders who came to her house. She was rarely absent from school. At that time, there were 16/17 students in the class. The teacher could easily guide all the students in the mathematics class. Her friends in the classroom were also helpful in teaching and learning from each other. Therefore, she felt mathematics very easy. She was always interested in doing mathematics. She did not have any difficulty doing similar mathematical tasks at home once the teacher demonstrated a sample problem in the class. Sometimes, the teacher used to connect mathematics problems with daily life problems.

Transitional experiences of mathematics learning. Diya came to Kathmandu with her parents when she was ten years. She missed

childhood games and played in the village. She joined a new school. She had difficulty in understanding mathematics in the Nepali language in the new class. She was not familiar with other students at the new school. Her classmates also did not help her in doing mathematics. She even hesitated to ask any question to the teachers. She felt dominated by her classmates because she came from a village and did not clearly understand the Nepali language, which is different from *Dotel*. That time, she missed her village friends too much. The teachers of the new school were not familiar to her. There was no sense of belonging to the school, teachers, and other students. The mathematics teacher used to teach students without paying attention to them. The instruction was fully teacher-centered, with continuously writing on the board and students taking down notes. She was not able to catch up with the teacher while taking down the notes. The teacher taught mathematics in a way that she could not understand clearly. She was hesitant to ask for help. She found it challenging to adjust herself to the new environment. Her classmates were not friendly to her when she asked questions. They used to say, "Ask the teacher."

Diya shared her experience,

"When I came at Kathmandu, I didn't understand Nepali language clearly, so I had problem to adjust in the new environment, and there was no teacher like my uncle. So, that time I didn't like to go to school also." She added, "I had difficulty in solving quadratic equations. I remember the formula of this kind of problem, but I was confused about how to use it while solving a problem."

Diya had several limitations in her mathematical experiences in the new school. The fifth-grade mathematics included simple algebraic expressions, number operations with factors and multiples, and basic geometry. She did not know how to simplify algebraic expressions. She did not know about computing the lowest common multiple (LCM) and the highest common factor (HCF) of a given set of numbers. The teacher used to demonstrate the procedure on the board, and students used to copy the procedure to follow the same way in other problems from the textbook. He did not use any model or manipulative to support students' understanding of the concepts. The teacher, most often, did not check the students' completed assignments. Sometimes, when he checked the assignments, he used to punish the students who made mistakes or did not do their assignments. Diya used to do her mathematics homework usually because she thought it would be a practice for her. The teacher did not care much about her assignments. Therefore, slowly, she became passive in doing mathematics out of the classroom. She found that several other students also did not complete their homework. Then, she followed their path, and rarely did she complete her assignments in mathematics.

The present experience of mathematics learning. When Diya was upgraded to the ninth grade, she could not focus on mathematics. She had to help her parents with farming works. Moreover, she was more interested in TV shows when there was no work at home. She lost her interest in mathematics. She could not focus on doing mathematics at home. When she was in grade eight, there was a change in the math teacher. However, the new teacher taught them better, with a more precise concept of the subject matter, than the previous one. However, the class was overcrowded with a large number of students. The teacher could not pay attention to individual students' learning of mathematics. At that time, Diya could not concentrate on learning mathematics. There were thirty-nine students in a small classroom. The teacher did not control the class activities well. The class was always noisy and

unfocused. Therefore, she could not understand anything in class. Even when Diya felt that she understood some maths taught in the classroom, she could not make sense of the problems and often got confused. She did not spend much time practicing mathematics problems. There was none at home to help her with math homework. Her father and mother were busy in their farming works. She copied the math assignments from other students, mostly from the first girl in the class, during break time. This activity further deteriorated her ability to solve mathematics problems independently.

Regarding current mathematics learning, Diya expressed,

"Now a days, I feel difficult in learning mathematics, because now there is no one to help me in doing homework and I have to go to vegetable farm to help my parents."

As a result, she had a low mathematical competency. She even had difficulty with simple calculations of the mean, median, and mode of a specific data set for grade nine. She got confused with several formulas in mathematics. For example, in grade nine math, there were formulas of a circle's area and circumference. She always confuses these formulas. She could not understand the meaning of algebraic expressions. For example, algebraic expressions like $(5x)^3 + x^3$ were even more difficult for her to make sense. She had difficulty in understanding the coefficients and indexes of algebraic expressions and variables. Diya tried to learn mathematics, but she needed help. There was none to help her or teach mathematics properly. Due to a lack of practice and support, she had always experienced difficulties in doing mathematics.

Diya's story shows that she had a good experience of learning mathematics well at an early age when she was in the village. However, when she came to Kathmandu, she had difficulty adjusting to a new environment. When she adapted to the new environment, she felt comfortable learning mathematics, but she again felt challenging to learn mathematics when promoted to the upper grades. She had to help her parents at work. Then, she had no more time to practice mathematics at home. Due to a lack of practice and support she needed in mathematics, it was difficult for her to learn mathematics. As a result, her interest in learning mathematics decreased year-by-year. She had a negative experience of mathematics learning due to low motivation, support, and performance.

Amita's Experience

The early experience of mathematics learning. Amita did not have any problems in early grade to learn mathematics that focused on basic counting, ordering, simple addition, subtraction, and multiplication. However, after grade one, she had difficulty learning mathematics, especially difficult to understand words, although she was familiar with numbers. However, she liked doing mathematics. She knew how to add and subtract. She learned to add by drawing lines and counting them together.

Moreover, she learned subtraction by crossing out the lines to find the remainder. At that time, there were many students, about sixty to seventy students, in a classroom. Therefore, the teacher had a problem in guiding and focusing on the learning of all the students. Amita also had to help her parents collect grass and fodder and bring water from a spring about one-hour walking distance. This way, she spent her childhood time supporting family works, and she did not have enough time to practice mathematics at home.

Amita wanted to go to school every day, but she was not able to attend school regularly. There was, sometimes, a lack of notebooks and

school bag, and other times, she had the pressure of household works. She used to get afraid of the math teacher for not doing an assignment. She used to be scared of being punished for not completing math assignments. The school used to pass or promote the students in the upper grades even when they failed in two to three subjects. Although she experienced difficulties learning mathematics, she was promoted to the upper grades even when she failed the math tests. It demotivated her to learn math because she was promoted to the upper grades even without passing the math tests. Therefore, there was no need to practice math too much. She could do simple addition and subtraction operations at that time, but she had difficulty reading and writing Nepali. Therefore, it made it difficult to learn mathematics. Hence, her mathematical experience did not help improve her performance in mathematics.

Transitional experience of mathematics learning. When Amita was nine years old, she joined a new school in grade four. That school was better than her previous elementary school because there was a library, a spacious playground, not in her last school. In her experience, the mathematics teacher in the new school taught her better than the former school. At that time, she was familiar with the Nepali language, but she had difficulty understanding long and complex sentences. There were few students interested and motivated in learning mathematics. A majority of them were not interested in learning mathematics. When she found some students interested in learning mathematics, she also wanted to study with them. The students seemed more disciplined in the new school than in the previous school.

All the students used to do assignments because they had a fear of punishment in the class. The mathematics teacher used to punish them by making them roosters and multiple sit-ups (*uthbas*). Mathematics teachers used to punish students whenever they did not complete their assignments. The math teacher was stricter than other teachers to discipline the students. Amita used to complete her assignment at any cost. Sometimes, she used to get help from her elder sister, and other times she sought the help of her friends. In her experience, she learned essential addition and subtraction operations by counting fingers. However, she learned the operations of multiplication and division by rote memorization of the multiplication tables.

Regarding her early mathematics learning, Amita said,

"We used to read the multiplication table loudly as a rhyme so that the sound reached our home at a distance of 30 minutes by walking. We used to read other subjects also loudly. One of the students used to stand at the front of the class and read the multiplication, and the other students would follow him/her. Like this, practicing many times, we recalled (memorized) the lessons. That time, I had a good experience in learning mathematics even by rote memorization."

Amita's family was not economically sound. Because of her family's low economic condition, her parents sent her Surkhet with her aunt, who was an assistant professor in an affiliated campus of Tribhuvan University. Then, she joined a nearby school in grade five. That time, she felt bored in the classroom. When her aunt knew about her reading weakness, she asked her to join grade three, but Amita disagreed. She told her aunt that she would work hard and continue studying in grade five. Then her aunt agreed with her interest to continue studying in grade five.

Her new school was better than the previous school because the students were also more disciplined, and the math teacher taught her nicely so that she could understand concepts better. All the students in

the new class were cooperating with her. She could ask challenging questions to the teachers and classmates. At home, she used to ask her aunt when she needed help in mathematics. Her aunt taught her how to read lessons and asked her to read and write simultaneously. She followed her aunt's suggestion. Then, she felt comfortable in learning math lessons. Amita learned to read with her aunt. She also helped with mathematics problems. When there was leisure time, she used to practice math or read lessons. With her practice in math and reading, with others' help, that time developed positive thinking about her ability to learn mathematics.

The new mathematics class was student-centered. The principal of the school was a lovely person to support the teachers and students. The school provided a scholarship for economically weak students. The school environment encouraged and motivated students to learn mathematics and other subjects. The teachers were also hard working. Amita loved learning mathematics. In the final examination of the sixth grade, she secured a seventy percent score with a position of section topper in section A. It motivated her to learn math and other subjects.

Amita shared,

"That time the teachers were hard working, the school was child friendly, friends and relatives were nice and helpful they were always ready to help me. All of these factors motivated me to learn mathematics."

Current experience of mathematics learning. After some time, Amita's aunt was transferred to another college in the same university in Kathmandu. Amita also came to Kathmandu with her aunt. She joined grade seven in Kirtipur Secondary School. At first, she had difficulty adjusting herself to the new school. There were about thirty-five students in the same classroom. The classroom was very crowded because of the small room for the number of students. She liked the math teacher, who always encouraged them to work on mathematics problems. He used to tell them about successful people and encouraged them to study more. However, in the new school, Amita's classmates were not helpful. Her new neighbors in Kirtipur were not helpful either. Therefore, she did not come out of her room at home or school during her leisure time. There was no friend to play together. However, she tried to learn mathematics herself based on class activities. Her mathematics test score went down. At that time, she was not happy with the school.

Regarding recent experience, Amita expressed,

"When the teacher teaches us, I understand mathematics taught in the classroom, but when I practice it at home, I get confused in most of the steps, like solving quadratic equations or proving theorems."

After completing the grade seven study, she joined another school in the eighth grade. The new school was on the morning shift. Amita's aunt again changed her school because Amita would not have time to help her at home if she joined the morning class. Amita had to change her schools because of her low economic condition, which directly affected her study. The main problem of changing schools was to adjust to the new environment with new teachers and students. It was challenging for her to learn mathematics with a new teacher in a new style. However, Amita liked solving algebra problems because she thought she knew the needed algebraic formulas, such as expanding $(a+b)^2$ and $(a-b)^3$ and using them in problem-solving. She said that she could understand the word problems. Another easy part of mathematics for her was statistics, especially the median, which was easy for her.

However, she had difficulty in other parts of mathematics, such as geometry theorems.

From the above story, it can be said that Amita had a bitter experience in early schooling. However, when she joined grade five in a new school, it changed her learning experience. At that time, the environment was very supportive of learning mathematics. Teachers and students in the new schools were supportive. At home, her aunt also guided her learning. Her dedication to learning/practicing mathematics helped to achieve a position in the final test. Unfortunately, she could not continue that school because her aunt was transferred to Kathmandu. She joined a new school in Kathmandu, but she had a problem adjusting to the new environment. The teachers and classmates were not supportive of her in learning mathematics. She had a massive workload at home. Altogether, her mathematics learning experience was not optimistic because the atmosphere was not favorable for her study, and she got demotivated from learning mathematics.

Raj Kumar's Experience

Early and transitional experience of mathematics learning. Raj Kumar remembered his early mathematics learning as problematic. When he was in grade two, the teachers used to come to the class and gave students some classwork, and immediately they went to the staff room. The teachers did not check assignments regularly. He could not even learn simple mathematics, such as counting. Then, his parents changed Raj Kumar's school when he was in grade four. He had a tough time in the new school because the teaching-learning was better than the previous school. In the new school, the teachers are not absent in the class, and they did not leave the class before the time. He felt comfortable with learning mathematics. He could understand the mathematical terms better at the new school. He scored a high grade on the math test. He could solve most of the mathematics problems from the exercises in the textbook.

Raj Kumar said,

"When I was at grade two, the teachers used to come to the class and gave us some classwork and immediately they went to the staff or office room. The teachers did not check our homework regularly. But, when I came to this school, the teachers are not absent and do not leave the class before the time. I felt comfortable to learn mathematics. Here I could understand the mathematical terms better. In grade four, I was considered as a talented student in the sense that I used to score a high grade in the test and I could solve most of the mathematics problems from the exercises in the textbook. Our math teacher focused on rote learning with a step-by-step procedure, but in an exciting way, we also memorized the mathematics step-by-step joyfully. That time I learned mathematics without any stress, fear, and anxiety. But from grade eight, I felt difficulty in learning mathematics."

Although his math teacher focused on rote learning with a step-by-step procedure, Raj Kumar was able to follow the step-by-step process, and he enjoyed it. The teacher used to repeat the lessons by providing students with more practice questions. Therefore, at that time, he learned mathematics and enjoyed it until grade seven.

Current experience of mathematics learning. When Raj Kumar was in grade eight, he started feeling math more complicated than in earlier grades. One of the reasons was that the math teacher was new. His relation with the teacher was not friendly. The mathematics teacher used to punish students even for simple mistakes, for instance, when the students forgot to bring instructional materials or copy answers from the solved examples on the whiteboard. He was afraid of his

mathematics teacher. The mathematics teacher used to solve almost half of the exercise problems. He used to leave the rest of the problems as classwork for students to complete. When someone made a mistake in any step, s/he would be punished.

Unfortunately, Raj Kumar had to sit at the side of the bench because he could not fight with other students for the corner seat. Therefore, his mathematics teacher always punished him even for simple mistakes, for example, not bringing some instructional materials what the teacher asked him to bring or simple errors in the calculations. He wanted to request his mathematics teacher not to punish them for simple mistakes and not to be rude with them and behave friendly.

Raj Kumar felt it challenging to memorize several math formulas. He had difficulty solving equations, area of solids, algebraic problem-solving, and calculating profit and loss. He could not give time to practice mathematics problems at home. Nonetheless, he tried to complete all assignments, although it was tough for him to achieve. In the party season, he had to work until midnight. Therefore, he could not sleep well, and sometimes he was absent from class too. However, his dad always encouraged him to learn mathematics. There was no one to help him in mathematics problem-solving in school and at home. Slowly, one of the geniuses felt difficulty in learning mathematics. He wished for classes in school without mathematics. That way, Raj Kumar liked mathematics at the primary level, but he began disliking mathematics after grade eight.

Raj Kumar said,

"I have to work at a party palace (to support family). So, I got free time only at bedtime. I tried to complete all my home assignments, but every time I couldn't. Mathematics needs more time to practice but I didn't have time to practice it at home. In the party season, I had to work until the midnight. So, I could not sleep well and sometimes not able to go to school."

From Raj Kumar's story, one can say that he had a bad experience in mathematics learning during early schooling. When he changed school and moved to a new place for the first time, he felt good at the new school. He enjoyed it and thought that it was easy to learn mathematics. He learned mathematics without any stress, fear, and anxiety. He was considered a talented student. However, this did not last long because, from grade eight, he felt mathematics difficult. The teaching/learning strategy was teacher-centered. The mathematics teacher was ruthless and not friendly to students. He had to go to work to support his parents. Therefore, he had no time to practice mathematics at home. He had more difficulty in learning mathematics than before.

DISCUSSION

From the narrative analysis, we found three distinct stages in the lived experience of learning mathematics by the three research participants—early schooling experience, transitioning in different schools, and recent experience of struggling with mathematics. These experiences portray underachievers' difficulties and challenges of mathematics learning that seem to be related to teachers, schools, curricula, and their own personal characteristics (Suan, 2018).

In the early school experience, Diya's learning experiences were influenced by her teachers, her peers, and informal plays with other students. Diya had a hard time doing mathematics. She had to help her

parents at home in the household chorus. On the other hand, Amita had no mathematics problem in grade one though she faced some difficulties in learning because of language problems and large class sizes. Her mathematics learning was influenced by irregularity in the classroom and household work pressure. Raj Kumar had an unpleasant experience of early school days. The teachers in his primary grades were not regular in the classroom that affected his learning experiences. He had to work out of home as child labor to support his parents. His involvement in the outside part-time job after school disturbed his study and performance in mathematics, leading him to be in the underachievers' category. These issues are related to social aspects such as family occupation and economy that parents needed children's support in household activities despite the children's play age. These social activities were more related to family subsistence rather than formal mathematics learning and development. Social constructivism emphasizes student's creation and teachers' role as facilitators (Ernest, 1991). Social constructivist emphasizes that mathematics learning occurs through the Zone of Proximal Development (ZPD) and scaffolding (Vygotsky, 1978). Despite some support in the early grades, these three participants did not have the opportunity to expand their ZPD due to a lack of appropriate support from the schools, teachers, and parents in learning mathematics, especially in the upper grades. The three participants' stories showed that they were deprived of learning mathematics due to passive approach to teaching-learning in the classroom and disconnection to their active working life in the day-to-day activities. According to Biggs and Hartung (1971), learning mathematics is a dynamic process that delights pupils in every aspect of mathematics, like number knowledge, measures, written calculation, shapes, etc. This activeness in the classroom process seemed lacking in the classrooms where the participants were studying.

During the transition from early mathematics to the developmental stage, Diya had difficulty understanding mathematics taught in the Nepali language. Her parents admitted her to a different school in grade five. It made her feel challenging to adjust to a new school environment with teachers and students. The mathematics teacher in her new school did not care about students' assignments. Slowly, she found mathematics as an uninteresting subject. For Amita, the experience of learning mathematics changed with the change of school in grade seven. She found herself challenging to adjust to the new school environment, which harmed learning mathematics. In her new school (current school), she could not find friends to adjust to the new environment. She lost her self-confidence and was not motivated to learn mathematics. Amita got demotivated to learn mathematics that shifted her status to a low achiever. The learning experiences were related to cultural and historical context of Nepali community in terms of internal migration and frequent change of schools creating difficulties for them. According to Alexander and Dooley (2017), learning is the acquisition of new knowledge or skills through interaction with others, whether that be by being taught by a teacher, observing, or self-taught. Teachers must be careful about their pupils' learning and how each individual learns best, and what environment. In this sense, Diya had a limited opportunity for interaction with their peers and the teachers. Past studies (e.g., Gasper, DeLuca, & Estacion, 2012; Raviv et al., 1990) reported a negative effect of school mobility student's motivation and performance due to observable and unobservable life circumstances in the new environment.

In her last stage in the current grade, Diya had a new teacher who used a different teaching style that she got more confused in

mathematics. She could not focus much on mathematics problems and assignments due to being busy with other works at home. She did not have any person to help in mathematics. She developed a negative attitude toward mathematics and had no interest in mathematics. Likewise, Raj Kumar found it challenging to understand mathematics school in the classroom at high school. He felt mathematics as a very difficult/disliked subject, and he hated mathematics. The mathematics teacher was a rude person (unfriendly) who used to punish Raj Kumar even for simple mathematical mistakes. This experience led to a decline in his interest in mathematics. These issues are related to both psychological and pedagogical aspects of learning mathematics. According to Piaget (1968), children learn mathematics according to their stages of mental development. He explored the stages of learning mathematics. However, these stages of child development and learning could not enter the classroom practices. The schoolteachers seemed not aware of such developmental stages to support students in learning mathematics. Research showed that students feel difficulties in learning mathematics due to many mathematics contents to be understood without their application to their real-life (Fletcher-Campbell, 2005). Some students may suffer from learning difficulties with a slow or inaccurate recall of basic arithmetic facts, answer problems impulsively, and have difficulty representing mathematical concepts mentally (Fletcher-Campbell, 2005).

Students' self-confidence in mathematics may influence their performance (Kunhertanti & Santosa, 2018). Their self-confidence at lower grades seems high and then seems to decrease at the upper grades (Mullis et al., 2008), leading them to be low achievers. Most of the low achievers in mathematics and other subjects are from families of low socioeconomic status. "In poor households, the economic value of child labor is high. In the case of destitute families, child labor is often the primary means of survival". These concerns from the literature seem to apply to Diya, Amita, and Raj Kumar as the factors for them being underachievers in mathematics with a combination of factors both in the home and at school could have caused underachievement (Chukwu-Etu, 2009). It might have further contributed to their inadequate understanding of mathematics, leading to insufficient motivation as vital factors for their low achievement (Ryan, 2012). However, the low achievement of students, in general, has been attributed to teaching styles as well. For example, Pokropek et al. (2018) reported that there is a negative correlation between direct instruction and the probability of students being low achievers.

Likewise, a negative correlation has been observed between adaptive instruction and students' probability of being low achievers. In addition, the likelihood of students being low achiever has a negative correlation with hours of learning. However, the likelihood of being a lower achiever has a positive correlation with the inquiry instruction (Pokropek et al., 2018). In the meantime, there is still a rigid classroom practice with disciplined and strict classroom norms. These norms are mostly guided by punitive actions of the teachers with negative reinforcement without adequate support to the students in their mathematics learning and development leading to several students to drop out the school (Rawat, 2018; Rawat et al., 2021). These issues seemed perpetuated due to lack of adequate training to the teachers to provide appropriate classroom environment (Panthi & Belbase, 2017) leading further to more inequity, lack of access to resources to several students, lack of caring and supporting environment to students from low income and marginal communities (Panthi et al., 2018).

IMPLICATION, LIMITATION, AND CONCLUSION

This study's results are based on only three cases (participants). However, the thematic analysis may help teachers, teacher educators, and other stakeholders know about underachievers' issues in mathematics. These thematic discussions may help in formulating hypothesis for a broader further study that may support in making a strategy to develop a positive attitude towards mathematics among the low achievers. It can also help those teachers/ researchers who want to research related topics. The findings of this study can help understand underachiever students' experience in learning mathematics so the teachers and researchers can/could find out the underachievers' area of difficulties, where they are confused, and what their misconceptions about mathematics are. Then teachers can treat them by clearing their misconception, extra focusing on their confusing area/ probable confusing areas. This will help such types of students in improving mathematics learning and performance, and develop a positive attitude by reducing their mathematical anxiety by implementation of appropriate teaching methods. In this sense, it may also help teachers change teaching-learning strategies to focus on students' interests and engage them in meaningful mathematics learning.

This research was limited to exploring the experiences of learning the three low achievers' mathematics at the secondary level. In this research, low/underachiever means those students who failed in mathematics in the previous terminal and final exams or who gained less than forty marks or obtained D or E grades in mathematics. This research focused on in-depth interviews with underachiever students' learning experience inside their classrooms while doing homework, doing classwork, during the exam period, in peer discussion, and the problems they face in learning mathematics. Therefore, it cannot be generalized to other students' learning mathematics experience who are high or medium achievers.

This study showed that students found mathematics a monotonous and challenging subject. They felt mathematics is not useful to their life. Students' attitudes toward math are affected by teaching-learning strategies, mathematical anxiety, teacher personality, household workloads, home, and school environment. Teacher's teaching strategy, behavior of teachers, attitudes of the teacher towards students, perceptions of students and teachers towards mathematics are the factors leading to negative attitudes towards mathematics. There are four dimensions psychological, pedagogical, social, and economic dimensions of mathematical experiences that play a significant role in low achievement in mathematics. Each of these dimensions influenced and shaped the underachievers' experience in mathematics. Future studies can explore students' lived/living mathematical experiences among the spectrum of good achievers, medium achievers, and low achievers in order to develop a better understanding of students' learning experiences in mathematics.

Author contributions: All authors were involved in concept, design, collection of data, interpretation, writing, and critically revising the article. All authors approve final version of the article.

Funding: The authors received no financial support for the research and/or authorship of this article.

Declaration of interest: All authors declare no conflict of interest in publication of this manuscript.

Data availability: Data generated or analysed during this study are available from the authors on request.

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APPENDIX

Interview Protocol

The interview protocol was a guide to initiating an informal discussion with the research participants to explore their mathematics learning experience.

1. How did you learn mathematics in your early grades? How was your learning experience in mathematics at that time?
2. How did mathematics teachers teach you mathematics? Did you understand or not?
3. Does/Did the mathematics teacher gave concepts about mathematics while teaching mathematics? If yes, how?
4. How were mathematical contents taught in the class? (before and now)
5. Does/Did mathematics teacher use instructional materials? If yes, how and what materials were used?
6. How easy or difficult was it to learn/understand mathematical language (questions)? (before and now)
7. Did you like mathematics? (before and now)
8. How did teachers and other persons motivate you to learn mathematics?
9. Does/Did the mathematics teacher focus on memorization (or understand)? (before and now)
10. Did/Does the mathematics teacher solve all problems or some in the class?
11. Did/Does the mathematics teacher check homework regularly?
12. What were the reasons/factors that affected your mathematics learning?