Social Inquiry: Journal of Social Science Research

2019, Vol. 1, No. 1, pp. 75-93

DOI: https://doi.org/10.3126/sijssr.v1i1.26918

Open Access

Article History: Received: 8 May 2019; Revised: 22 August 2019; Accepted: 10 October 2019

Original Article

Formative Assessment and Achievement of Mathematics Students in Community Schools of Nepal

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Abstract

Formative assessment is one of the leading elements of every classroom instruction for making learning contextual and students centred. The formative assessment creates such space where a teacher as adult supporter plays the role of scaffolding on the learning performance of their students. I studied the formative assessment and students' achievement status in mathematics through survey research design. I used the contingency questionnaire as research tool under quantitative research approach. The study was conducted within the target population; total number of community schools and their mathematics students (i.e. 547) who have participated in District Level Examination in 2014. I employed simple random sampling procedure to select the sample respondents (i.e. 232). The contingency questionnaire for students with 0.74 value of internal consistency was used as a research tool to collect the basic information for the study. Regarding the theoretical framework, I used Tomlinson's Differentiated Classroom Instruction

ISSN: 2705-4853; e-ISSN: 2705-4861

and Assessment: Philosophy of Differentiation. The research depicts that regularity of teachers' responses (check) or feedback on the students' classwork, homework, project work and tests have a creditable role in improving their students' learning performance. Furthermore, project work, a form of formative assessment, helps to improve students' learning performance through creating an opportunity for learning by doing, which also contributes to contextualize the abstract concept of mathematics.

Keywords: *Assessment; feedback; achievement; Mathematics students; Nepal*

Introduction

The teacher enters the classroom. "Good morning, Sir!" the students greet the teacher. "Good morning, class!" the teacher greets back. "Sit down!" the teacher says. "Turn your book to page no….." The teacher asks the students to look at certain page. The teacher solves a problem on the black board. The students copy all symbols and signs from the board. "You can solve the problems of this page and the next by the same process, so try to do all," the teacher says. The teacher teaches, solves a few mathematics problems and the students copy from the board in their notebooks. However, the teacher does not check and provide feedback on the students' work and the problems solved by them in the class or at home. The students do not get a chance to participate in any tests except the terminals. The teacher does not give any project work in mathematics. May be it was out of imagination for both the teacher and the students. The teacher has been continuing the same practice in all mathematics classes for years. This excerpt reflects how I learned mathematics in school.

When I went on to study higher education, I feel that I got excellent opportunities, which developed my level of confidence in mathematics education and motivated me for further learning. The reality of my higher education practices was the course facilitators always tried to understand the students' interest, need, and learning ability by administrating a variety of assessment tools. Furthermore, the facilitators helped their students by providing effective feedback and motivational counselling. Because of such instructional processes, I got many opportunities to realize the importance of the assessment tools and teachers' feedback.

There are several definitions of students' learning assessment. National Curriculum Framework for School Education in Nepal (Curriculum Development Center [CDC], 2007) defines that assessment is a process of gathering, interpreting, recording and analysing data, using information and obtaining feedbacks for re-planning educational programme. Assessment is a systematic process of assessing goals and outcomes of any discipline or activity as well as the progress of every human. In this study, assessment indicates educational assessment (i.e. students' learning assessment). National Assessment of Grade VIII Students (Education Review Office [ERO], 2008)

states that assessment is useful for monitoring the progress of the system of education, helping teachers to perform better, making parents, teachers, administrators, policy makers, textbook writers, etc. aware of the situation, and establishing the realistic standard of student achievement (p. 6). Therefore, students' assessment is an integrated part of every instructional activity and education system. According to Suskie (2009), assessment is a continuous process which always intends to provide the varied opportunities to students based on their learning evidence.

How do we know students' learnability, progress, and difficulties? How do we know the student understanding of the particular concept? Obviously, the answer is by administrating varieties of assessment tools. Among many dimensions of assessment in this research, I examined the status of formative and summative assessment. In other words, formative assessment is conducted during instructional activities and academic session to improve students' learning. Unlike the formative assessment, the summative assessment is conducted at the end of the academic session or lesson to assign students' grades or academic outcomes (Tomlinson & Moon, 2013). Especially these practices are very popular in the context of Nepal.

Simply, achievement means the status of accomplishment of the entire tasks/goals. Furthermore, achievement refers to the accomplishment of 'something' through self-motivation. Here 'something' means the articulated learning goals or desired objectives/goals of learning. In this study, 'achievement' indicates the academic achievement of a student. Achievement is the determination of a student's academic competencies in related content areas, abilities necessary to succeed in school and real-world contexts (Bates, Shifflet, & Lin, 2013). In the context of Nepal, similar practices are being used to examine the school level academic achievement. However, some variances exist in the ways we measure the academic achievement and their influence in the determination of academic achievement.

The standardized tests and students' grades/scores of summative assessment are popular techniques to measure students' academic achievement in Nepal. The national level examinations (as School Leaving Certificate, now Secondary Education Examination) at the end of grade 10, the District Level Examination (now, Basic Level Examination) at the end of grade VIII and National Assessment of Students' Achievement (NASA) under ERO are using the students' obtained grades/scores in different subjects as their academic achievement in context of Nepal. On the basis of such practices, I also used students' grades/scores of District Level Examination as a Students' academic achievement of Mathematics in this study.

Students' Learning Assessment

Motivating and encouraging students to learn a mathematical concept is not easy because many factors/variables which may directly affect students' performance/ achievement in mathematics like, teaching learning methodologies, professional issues of

teachers, students' cultural background, classroom assessment practice in mathematics, use of technologies, etc. These factors may de/motivate the students to learn new concepts of mathematics. The de/motivation of student's learning depends on teachers' pedagogical activities. Classroom assessment is one of the major components of thoughtful classroom activities, which must improve students' learning and creativity, not just measure it (Harper, O'Connor, & Simpson, 1999).

I came to realize from my own teaching experience that many students are interested in participating written assessment (or paper pencil test); however, they are also interested in participating activity related test or performance based assessment. For example, some students were found enjoying fieldwork, preparing the report of field trip related to mathematical knowledge, developing project work like finding the area of a rectangular field, volume of cube using real solid materials, profit and loss by visiting shopping centers, simple interest by visiting banks, etc. Unlike activity-based test, some students enjoyed the practice of bookish knowledge like solving the problem from book, copying definitions; they were not interested in getting involved in practical work, project work, and fieldwork. So there should have been different forms of assessment to measure student's learning improvement in mathematics.

Freeman and Lewis (2005) clearly state four different dimensions of assessment; formal and informal, formative and summative, final and continuous, assessment for product and process. Here, my concern is in formative (assessment for learning) and summative (assessment of learning) dimensions of assessment. What do they mean? The etymological meaning of 'formative' is the formation of something. So, formative assessment means to enhance, motivate and empower every student to do or to learn something better by administrating different forms of assessment with constructive feedback. Formative assessment frequently takes place during instruction allowing teachers to provide feedback and make adjustment that helps to ensure students' success (Hamm & Adams, 2009). It may be an answer to why formative assessment is necessary in teaching learning activities.

Harper et al. (1999) state that the summative assessment makes decision for further study and utilization of right time. The summative assessment of students learning provides final decision to upgrade the students, to modify the educational policies and practices and to examine the academic year as a whole. Moreover, it gives information whether students need to be upgraded or not? So while conducting this study, I used students' score of final examination (summative assessment) as an indicator of their achievement in mathematics.

Students' Learning Assessment in Nepal

Achievement of Mathematics in case of Nepali students is found very critical like out of five core subjects, most of the students are unsuccessful in mathematics; even if they are successful, they are not able to score better. If we observe the SLC result of 2013 and National Assessment of Student

Achievement 2013, the national average score of mathematics is 36.40 out of 100 and 35 percentage out of 100 (ERO, 2015) respectively, which are not in the satisfactory level.

These results are the model examples but it is happening for a long time in the Nepali context. What is our weakness as a stakeholder of education? Is our students' evaluation system defined by curriculum really able to measure the students' performance/achievement? Curriculum of Basic Education Grade 6-8 (CDC, 2012) states that the students' evaluation in case of grade VIII, the instructional activities and students' learning is assessed through continuous assessment /formative assessment but at the end of this grade District Education Office (DEO) takes 100 marks external written examination (paper-pencil test) and the result of the examination decides whether students are successful or not. Similarly, the District Level Examination (DLE) is conducted at the end of Grade VIII [SSRP 2009-2015, 2009]. So, these are the policies of our basic level students' academic evaluation system.

The implementation part of educational policies in the context of Nepal is in critical condition. However, formative assessment is a process used by teachers and students during instruction which provide feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes (McManus, 2008). Is this happing in Nepal? It may be a leading concern of research in case of effective implementation of our basic level education policies and their contribution in students' achievement.

The assessment system may have a discursive role in making our basic level mathematics instructional activity contextual and glocal. The most important function of formative assessment is for improving students' learning achievement (Berry & Adamson, 2011). However, students' motivation, creativity and assessment for learning practices in Nepali community schools seem to be not supportive to their leaning improvement (Parajuli & Das, 2013). Is the low achievement of grade VIII students due to such instructional practices? What are the existing practices of students' assessment for learning and implementation of education policies in Nepali basic level mathematics classroom? These are very crucial issues to be addressed through academic research but researchers have not conducted any research on the issues in context of Nepalese basic level mathematics education. Therefore, among these several issues, I was interested in seeing the status formative assessment and achievement of mathematics students.

Differentiated Classroom Instruction as Theoretical Stands of Formative Assessment

Tomlinson (1999) states that the philosophy of differentiation in classroom instruction provides multiple approaches to content, process and product based on students' needs and interests. Furthermore, the content, process and product means the input or what students learn, how students go about making sense of ideas/information and output or outcomes respectively (Tomlinson, 2001).

Under the multiple approaches to the process of differentiated instruction, students' learning assessment is an embedded part. Furthermore, Tomlinson states that the students' assessment is no longer predominantly something that happens at the end of a lesson or session to determine "who got it" more than that the assessment in Differentiated Instruction (DI) is to determine the particular needs of individuals in relation to the unit's goals. Therefore, student's assessment in case of classroom instruction is one of the ongoing processes which has a significant role in students' learning progression. A passionate teacher can assess the students' developing readiness level, interests and modes of learning by administrating varieties of assessments.

Formative assessment (ongoing assessment) is one of the dimensions of assessment. It is a constructive dimension of students' learning assessment and informative for every stakeholder of instructional programme/activities, which designed to follow a student's progress as they attain essential learning outcomes as a unit of study progresses (Tomlinson & Imbeau, 2010). For the first time, Michael Scriven used the term 'formative evaluation' in connection with curriculum and teaching (Scriven, 1967, as cited in Black & Wiliam, 2003). The most important nature of formative assessment is to enhance, empower, and motivate every participant for active participation in every pedagogical activity. It is not only important for students but also for instructors to be aware on the effectiveness of the implemented pedagogy.

One of the most essential dimensions of students' assessment to improve students' learning is formative assessment. Students' assessment becomes formative "when the evidence is actually used to adapt the teaching to meet students' needs" (Tomlinson & Moon, 2013). Therefore, effective use of formative assessment is among the most powerful classroom tools for contributing to students' learning achievement (Hattie, 2009; Yeh, 2011; Hattie, 2012a, as cited in Tomlinson & Moon, 2013).

Formative assessments within classrooms provide information that should facilitate improved pedagogical practices and instructional outcomes (Dunn & Mulvenon, 2009). Formative assessment in classroom instruction means to examine the function of instructional activities through students' active participation. The researcher argues that formative assessment is not only for the improvement of instructional activities more than that it is essential to improve students' level of confidence in related subject matter.

In this study, formative assessment means those assessment practices, which create space to provide effective feedback to improve teacher's instructional strategies and student's learning performance/achievement. According to Wiliam (2013), "The formative assessment is one of the most powerful ways of improving student's achievement" (p. 15). Formative assessment is to improve students' achievement through quality of feedback, which may be crucial for both teachers and students to modify and improve the pedagogical activities as well.

However, there may be a question 'how does it improve students' learning achievement?' It is easy to answer because it is possible by providing constructive feedback to the learners based on their academic performances. In the same sense, McGatha and Bush (2013) clearly state that the formative assessments include teacher questioning and feedback during lessons, student writing assignments, and individual or group projects. Formative assessment is a bridge between interaction/communication between students and teacher during classroom instruction and in their teaching and learning improvement.

Forms of Formative Assessment

There are different forms of formative assessment or assessment for learning, which may help to improve students' level of confidence, logical thinking and performance/achievement in each subject area through teachers' effective feedback on their academic activities. Wren (2008) summarized that if the different forms of formative assessment; classwork or class discussions or question-answer sessions, homework, project work or performance based assessment and tests or quizzes are implemented appropriately then the formative assessment can be a powerful tool to improve students' level of confidence, creativity and logical thinking. On the basis of these presented ideas, I also conducted this research study on formative assessment of mathematics students in the context of Nepal. Here, I illustrate four core forms of formative assessment, which I have used in this study.

Classwork of mathematics

The assignment of mathematics, which is given during mathematics class by a teacher to students, is called classwork of mathematics. It may be administrated before starting the lesson, during the lesson, and/or after the lesson by the course facilitator. Klem and Connell (2004) state that the engagement of students in their classwork is not only undertaken for work but also to invest a lot of effort, persist with their work, self-regulate their own behaviour towards achieving goals, challenge themselves to improve, and enjoy task challenges and learning (as cited in Stroud, 2014). So, the main intention of students' classwork is to check their learnability, activeness, and understanding of particular lesson of mathematics respectively in classroom.

Homework of mathematics

The assignment of mathematics which is given after the classroom activity to revise the lesson at home is called the homework of mathematics. Furthermore, the homework is any assignment that an instructor wants the student to complete during non-school time as well as out of classroom instructional time (Cooper et al., 2006, as cited in Cheema & Sheridan, 2015). So, the main purpose of homework is to provide numerous opportunities to revise, practice independently particular lesson that has been discussed or learnt in mathematics class. Moreover, it is decisive for every learner to update his or her mathematical concepts and problem-solving skills.

Project work of mathematics

The assignment of mathematics, which is given to realize and understand more applicable form of mathematical knowledge related to daily life activities, patterns of nature, patterns of cultural infrastructures, cultural practices and so on, is called a project work of mathematics. I argue on the basis of my teaching experience that a project work is more structural than other forms of formative assessment because it is time specified, designed in equal efforts of subject teacher and heterogeneous group of students and equally involves the teacher and students for a particular task. Finally, it expects the productive outcomes. Moreover, project works are useful in developing independence, organizational skills, resourcefulness, and a sense of ownership over work, and may induce a deeper level of learning and understanding (Miller, 2002). The main intention of project work in mathematics is to help the learners to realize and understand the abstract concept of mathematics connected with well-known cultural artefacts and real life activities.

Teaching school mathematics by using cultural artefacts would greatly help teacher and students both to link the western mathematical knowledge with their own cultural capital (Luitel & Taylor, 2007). If we link and contextualize the western mathematical knowledge and concepts in such ways, the mathematics teaching learning activities would be more constructive which enables students to be familiar and understand the lessons easily. The Curriculum of Basic Education, Grade 6-8 (CDC, 2012) argues that to implement students' gained mathematical knowledge in their real life activities, the teacher must be motivated to involve every student in practical exercises and investigations according to their level of knowledge. Furthermore, it is possible to administrate different types of practical work as well as the project based work of mathematics in heterogeneous group of students.

Tests of mathematics

The assignment of mathematics that is administrated to examine the effectiveness of instructional activities and students' learning progression in particular lesson and particular unit/chapter besides the final examination is called a test of mathematics. Furthermore, the main purpose of the test is to convey the tester how well the testee knows and can do something (Ur, 1996).

The central intention of a test of mathematics is to improve, modify, or continue the instructional activities of teacher and to update the required knowledge continuously of learner, improve and modify the teaching and learning process, and in addition, to review the previous knowledge of students. Its concentration is in improvement of students' learning rather than grading. Such types of tests do not have any specific rule and regulation.

Furthermore, it may be written or oral or both forms for example, lesson test, unit test, class test, weekly test, monthly test, term wise tests and so on. Under term wise test, the first term test (i.e. administrating after three months of academic session) and the second term test (i.e. administrating after six months of academic session) are most popular in

practices of students' internal assessment in the context of Nepal [CDC, 2012].

In the context of Nepal, the priority areas of School Sector Reform Program/ Sector Wide Approach Extension Plan 2014/15-2015/16 (Ministry of Education, 2014) are the implementation of continuous assessment /formative assessment and remedial support system in school level education, which are crucial to improve students' learning. The Nepali education policy makers are also realizing the importance of formative assessment and its feedback as a remedial support and more crucial and significant way to improve students' performance/ achievement.

Methods

This research study followed survey research design for both primary and secondary data. The researcher collected the required information by administrating contingency questionnaire to the sample students and their answers that create the data to be analyzed. I administrated the contingency questionnaires among 232 grade-8 students of community schools in Nepal. The sample size is collected through simple random sampling. While analysing the collected data, I used the different statistical tools under the descriptive statistics and made the meaning of study findings by blending similar previous studies and literatures.

Formative Assessment and Status of Student's Learning Achievement

Formative assessment may be a crucial dimension of students' assessment to improve their level of confidence and learning in every subject. The researcher assumed that classwork, homework, project work and tests, except final examinations were forms of formative assessment. Likewise, the teachers' feedback on the basis of these forms of assessment may be important for students' motivation and improvement in their learning. Therefore, in this section I analyzed the forms of formative assessment, its feedback and achievement status in governmental schools.

Classwork

Table 1: Classwork and Students' Achievement

Category	Status	N	%	Achievement
Classwork	Checked	224	96.6	38.55
	Unchecked	5	2.2	33.00
Frequency of Feedback	Provided	119	51.3	39.77
	Sometime	97	41.8	37.43
	Not provided	8	3.4	33.88

(Field Survey, 2015)

As shown in Table 1, out of 229 students, 96.6 percent students' classwork was checked by their mathematics teacher. The result shows that those students whose classwork

was checked by teacher have greater average score (38.55) in mathematics than those students' average score (33.00) whose classwork was not checked. Of 96.6 percent students, 51.3 percent students' classwork was regularly checked by teachers, which was followed by feedback. The remaining 41.8 percent students got feedback sometimes and 3.4 percent did not get feedback on their mathematics classwork. The result shows that those students who got regular feedback on their classwork have greater average score (39.77) in mathematics than other two groups of students whose average score is 37.43 and 33.88. The result shows that a passionate teacher need to check students' classwork and provide feedback regularly on their classroom. It is fruitful for every learner to improve his or her level of achievement and confidence in mathematics. Therefore, class tasks of students influence their achievement level.

Active participation of students in classwork and feedback from teacher is one of the beneficial ways to improve their learning. When students get more opportunities to discuss with friends, share the knowledge and experiences of particular task, thesee develop the level of confidence in them (Cowan, 2006). Teachers' feedback in case of students' classwork is very sensitive to uplift students' understanding of a particular concept in mathematics. To keep students engaged and focused on their classwork of mathematics students have to receive teachers' feedback on time for both learning progression and achievement. In addition, timely feedback involves commenting on students' classwork with a frequency that helps the students maintain their interest in and commitment to the work (Evertson, Poole, & Center, 2003). Furthermore, the finding shows that the regular feedback from teacher in students' classwork is better for improvement in achievement of mathematics students.

Homework

Table 2: Homework and Students' Achievement

Category	Status	N	%	Achievement
Homework	Checked	206	88.8	38.25
	Unchecked	25	10.8	36.96
Frequency of Feedback	Provided	134	57.8	38.49
	Sometime	68	29.3	38.00
	Not provided	4	1.7	34.50

(Field Survey, 2015)

Table 2 depicts that out of 231 students, the teachers checked 88.8 percent students' homework and their average achievement score was 38.25. It is greater than those students' average achievement score (36.96) whose homework was not checked. Furthermore, out of 88.8 percent students, the teachers regularly provided feedback to 57.8% and sometimes provided feedback to 29.3% students. The remaining students did

not get feedback on the basis of their mathematics homework. The difference in average achievement score of first group (38.49) and second group (38.00) of students is not very wide but it is not same in case of the third group (34.50) of students. Therefore, the result depicts that it is necessary to check the students' homework and provide feedback (but not necessary to be regular) to improve their learning achievement.

For better learning in mathematics classroom, discussion and activities are not sufficient because some concrete forms of knowledge need to be understood by students in their own ways. Every student has different ways of learning so to internalize, realize and connect with real life activities, homework plays a discursive role in mathematics (Valle et al., 2015). To reduce the gap between students' self-learnability and objective of the particular lesson through homework, there must be teachers' feedback. Timely feedback from teacher and examples on the students' homework paper are followed by further opportunities to practice and understand the basic concept of mathematics (Brookhart, 2008). However, the finding shows that there is no higher difference in achievement of mathematics students on the basis of time of teachers' feedback on their homework.

Project Work

Table 3: Project work and Students' Achievement

Category	Status	N	%	Achievement
Project work	Checked	124	53.4	38.49
	Unchecked	4	1.7	35.25
Frequency of Feedback	Provided	55	23.7	43.51
	Sometime	67	28.9	36.31
	Not provided	2	.9	34.50

(Field Survey, 2015)

According to Table 3, out of 128 students, 53.4 percent students' project work was checked by teacher. Similarly out of 53.4 percent students, the teacher regularly provided required feedback to 23.7 percent of students on their project work. The comparative mean score of the group of students who received feedback regularly and the group of students who received the feedback sometimes, shows that the first group of students have greater average score (43.51) than second group whose average score is 36.31.

It shows that it is very important to provide regular feedback for the students on their project work of mathematics. Project work is not only for improving the level of achievement in mathematics. Furthermore, it is a way to understand the implication of mathematics in daily activities. Project works of mathematics motivate every student to

think, develop and learn mathematical concept by linking them with their own surrounding. Another important function of project work of mathematics is motivation every student engages in mathematical thinking, which is not limited in classroom activities only. Furthermore, the research finding of Branch (2015) shows that there is a significant difference between mathematics instructional approaches (project-based instructional approach and traditional instructional approach) and achievement of mathematics students. On the basis of these both research findings, I recommend incorporating project work as a form of formative assessment in mathematics. However, regular feedback from teacher on students' project work of mathematics is also equally significant to improve their achievement.

Tests

Table 4: Tests and Students' Achievement

Category	Occurrence	N	%	Achievement
Test	First and Second term only	107	46.1	37.74
	Others within first and second term	125	53.9	38.71
Frequency of Feedback	Provided	107	46.1	38.91
	Sometime	107	46.1	37.68
	Not Provided	16	6.9	38.56

(Field Survey, 2015)

In mathematics learning, the role of different types of tests is to update the mathematical knowledge gained by students from different activities. During the research, I separated tests in two separate forms based on the Nepali practices like, first and second term tests only (i.e. administrating at the end of first three months and first six months of an academic session respectively) and other (i.e. class test, unit test, weekly test, monthly test, and etc.).

The result shows that out of 232 students, 46.1 percent students participated only in first and second term test and the remaining students participated in both forms of tests. The students who participated in both forms of tests have greater score (38.71) than those who participated only first and second term tests where their score is 37.74.

The result shows that equal number of students got the teachers' feedback on their test paper regularly (46.1% out of 230) and sometime (46.1% out of 230). However, the

average achievement score of first group (38.91) of students is greater than that of second group (37.68). Therefore, the statistical result shows that the teachers need to motivate his/her students to involve in tests that are conducted during classroom instruction and throughout the academic session. Furthermore, passionate teachers provide effective feedback on students' test paper.

Tests is one of the most popular forms of the formative assessment in Nepali school education system. Different research and reports show that it is crucial to improve students' learning and achievement by implementing different types and frequencies of test in classroom activities (Bangert-Drowns, Kulik, & Kulik, 1991; Deck, 1998; Zgraggen, 2009). Furthermore, this research study represents that it is important to administrate varieties of tests in mathematics classroom and teachers' feedback is also equally important to improve students' achievement in mathematics.

Formative Assessment in Student's Learning Performance

I examined the forms of formative assessment and students' achievement status in mathematics. The different forms of formative assessment influence students' learning achievement (Cowan, 2006). So, all forms of formative assessment play important role in mathematics teaching and learning activities. Furthermore, it is essential to design formative assessment as an integral part of teaching and learning at all levels to improve students' learning. To administrate the different forms of formative assessment in mathematics classroom for students' learning improvement in maths classwork, homework, project work and tests are not sufficient. Similarly, the most supplementary part for improvement of students' learning achievement is to respond in time and provide constructive feedback to students.

Classroom assignment is one of the interactive forms of formative assessment to share knowledge, ideas, experiences and difficulties faced by the students. In mathematics teaching and learning, it is crucial to uplift the students' learning achievement and understanding. Classwork is such a form of formative assessment motivates the students to participate actively in every classroom activities (Stroud, 2014) and it is essential to improve students' learning achievement by creating interactive classroom activities (Lim & Meer, 2015). In addition, this study found that the regularity of teachers' response and effective feedback based on students' mathematics classroom assignment plays a vital role to improve students' learning achievement.

Similarly, another important form of formative assessment which helps to develop self-confidence in every student is homework. Homework as a form of formative assessment plays a significant role for reinforcing students' learning. It enhances the development of self-regulation processes and self-efficiency beliefs, goal setting, time management, and maintaining attention for particular task, which are most required in case of mathematics learning (Bembenutty, 2011). In the context of Nepal, it is one of the popular forms of formative assessment. The regularity of teachers' response on students'

mathematics homework is directly connected with their learning achievement. Furthermore, homework is such a form of students' assessment which improves students' learning by providing many opportunities to develop their self-confidence, autonomy, and sufficient time to interact and connect the presented issues with real life activities (Fernández-Alonso, Suárez-Álvarez, & Muñiz, 2015). However, Kitsantas, Cheema, and Ware (2011) showed that more time spent on mathematics homework does not necessarily translate into higher scores in mathematics.

The finding shows that there is no higher difference in students' achievement in mathematics between those who received feedback from teachers regularly and who received feedback from teachers sometimes on their homework. But it was not same with the students who did not receive the feedback on their homework. In contrast, who spent more time on mathematics homework and anxious have opposite effects on mathematics achievement (Cheema & Sheridan, 2015). Therefore, as a passionate teacher it is essential to know that the ways we increase the effectiveness of homework for all learners in the inclusive classroom (Carr, 2013).

Nowadays, project work is also becoming popular as a form of formative assessment to improve students' learning. I also examined project work as a form of formative assessment and students' achievement status in mathematics. The finding depicts that there is high influence of students' mathematics project work experiences in their achievement. The regularity of teachers' response on students' project work is one of the supplementary parts to improve their learning achievement. By administrating the project work, the students understand the connection between the school subjects in an authentic learning environment; in addition their understanding of the importance of mathematics in real-world situations increases, which is directly connected with students' learning achievement (Kokko, Eronen, & Sormunen, 2015). It is equally important to provide constructive feedback to the students. It makes high differences in students' learning achievement which is shown in this study.

The regularity of teachers' feedback on the students' project work is one of the factors that motivates the learners to become a high achiever. Project work and its feedback require collaborative effort among the students which provides creditable opportunities to apply the gained knowledge from theoretical to practical (Musa, Mohamed, Mufti, Latiff, & Amin, 2015). Therefore, to make mathematics teaching learning activities more contextual and practical, the teachers must be aware about the project work or project based teaching-learning activities. However, the research shows that the importance of project work as an embedded form of formative assessment to improve academic achievement of students in mathematics.

In the context of Nepal, another most popular form of formative assessment is classroom test (besides final examination) like unit test, lesson test, weekly test, monthly test, term wise tests like first term (i.e. after three months) and second term (i.e. after six

months) and so on. Tests, as a form of formative assessment, play decisive role to improve students' learning achievement. The students who participated in all kinds of the tests perform better than the students who have participated in term wise tests only (i.e. first term and second term). In order to improve the students' performance, it is important to administrate the varieties of tests which give more opportunities to update and interact about particular issue with teacher and in peer group (Suurtamm & Neubrand, 2015). Furthermore, the varieties of tests have productive influences in flipped instructional activities to improve and motivate the learner as a high achiever of their learning (Eustace, Bradford, & Pathak, 2015). Therefore, it is crucial to administrate the varieties of tests to enhance the level of students' learning achievement.

However, those students who are assessed by formative assessment of their learning activities performed better in their learning achievement (Mehmood, Hussain, Khalid, & Azam, 2012). Furthermore, the findings of the study showed that it is not sufficient only to administrate the variety of tests to improve students' learning. Teachers' response and regularity of effective feedback on students' answer sheet of different tests also have essential role in students' achievement in mathematics. Many students have test anxiety (TA) of mathematics which demotivate the students in mathematics learning (Nyroos, Jonsson, Korhonen, & Eklof, 2015). Therefore, in such a condition, the teachers' constructive feedback may play a fundamental role to remove the test anxiety (TA) of students and motivate them towards learning and becoming a high achiever.

Furthermore, regarding students' motivation in learning, Brown (1994) states that effective learners operate best in their learning when they have insight into their own strengths and weaknesses (cited in Tomlinson & Moon, 2013). It may raise the question; how do the teacher can know and inform the students' strengths and weaknesses of particular subject matter? As an answer to this question Tomlinson (1999) suggests that to create multiple approaches in process of classroom instruction and assessment, which also supports the findings of the study. Therefore, it is influential if the teachers' administrate multiple forms of students' assessment in classroom instruction to analyse the students' strengths and weaknesses.

Informing students about their strengths and weaknesses in particular subject matter and the teachers' feedback strategy (i.e. time of feedback) play important role in improving learning achievement of the students (Ajogbeje, Ojo, & Ojo, 2013), which is also shown in above discussions. To examine the significant differences of teachers' feedback strategies (i.e. audiences and modalities of feedback) in students' achievement in mathematics, the researcher used further analysis.

Conclusion

There are four most popular forms of formative assessment in the context of Nepal which are classwork, homework, project work and different type of tests. The forms of students' assessment in their learning processes are necessary elements to identify the students' strengths and weaknesses in

particular subject matter. Students are motivated when they are informed of their strengths and weaknesses in particular learning tasks, which is possible through teachers' feedback. The regularity of teachers' responses (check) and effective feedback on the students' mathematics classwork, homework, project work and tests have a creditable role to improve their learning achievement. Among the four forms of formative assessment, the most popularizing form is project work which helps to improve students' learning through learning by doing approach. So, it would be better if each of mathematics teacher practise the project work while conducting teaching learning activities.

The major concern of this research was to examine the status of formative assessment and students' achievement in mathematics. So, the findings of this study are applicable in enhancing the students' learning achievement in mathematics as well as other areas. I claim that it is useful for the policy maker, teachers who are concerning school level mathematics, and other researchers as well.

Competing Interests

The author declares that no competing interests exist.

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