Original Research Article

Investigating Mathematics Homework Practices of Higher Secondary Teachers in Bhutan.

ABSTRACT

The aim of the study is to investigate how mathematics homework practices of teachers enhances students' academic achievement in Higher Secondary Schools of Bhutan. Homework is one of the important practices in the Bhutanese school system yet it is the least explored area; thus, this study investigate the homework practices of teachers in higher secondary schools in Bhutan. The study found that 62.3% of mathematics teachers assigned homework every day or at least four times a week, and there is no statistically significant difference in frequency of homework between Urban, Semi-urban and Rural schools of Bhutan. Teachers' primary purpose in assigning mathematics homework was to reinforce what was learned in the class through practice and revision. There is a significant positive correlation between homework purpose and homework management and the homework purpose variable explains the homework management variable by 19.1% only as there are several challenges that hinders the effectiveness of homework.

Key Words

Homework purpose, homework management, homework frequency, relationship between homework purpose and homework management.

Introduction

Homework is a common educational activity that plays an important role in children's everyday lives [8]. Ideally, homework provides teachers with feedback on students' learning, and accordingly, teachers can adjust their teaching and re-teach the concepts again if necessary, before assigning exercises [34]. Teachers assign mathematics homework to ensure understanding of the subjects, and to retain knowledge [15]. In addition, study shows that the elementary school teachers' focus on assigning homework was on teaching and enhancing time management skills in students, while the secondary school teachers' focus was on knowledge enrichment [22].

According to the perception of parents, teachers, and students, the purpose of homework is to reinforce what is learned in class and develop self-regulatory attributes; however, students confirm that they do homework to get teachers' and parents' approval [38]. Further, homework purpose is associated with HW management, as HW management was positively associated with learning-oriented reasons such as working independently and getting good grades [37]. Therefore, the purpose of homework is to ensure students' academic learning; in addition, it is to develop students' independent learning and time management skills and make them responsible people.

Academic benefits of doing homework

Homework enhances students' academic performance. Several studies have shown that homework has a positive impact on students' learning [4] reported that homework improves students' academic achievement because it allows them to revisit and reflect on what they have learned in class. Academic achievement is positively influenced by homework, those students who did homework fetch better scores academically [7, 8, 25]. Similarly, the amount of homework students completed and achievement were found to be positively correlated, especially at higher grades (6–12) [9]. Likewise, by doing HW students develop study habits and skills, as well as improve their attitude towards school [7, 30]. Nevertheless, boring assignments cause negative emotional responses from students, and they lose

interest in their studies [30, 36]. Further, homework overload is negatively associated with students' academic performances [18, 32] as bulky homework exhausts students both physically and mentally [8]. Studies also reported that hours of homework is negatively associated with students' psychological well-being and physical health symptoms [17]. Thus, assigning the right amount of homework seems important as homework overload impacts students' physical and mental health and more importantly it impacts their academic achievement.

Homework is most often supervised either loosely or too authoritatively by adults [11]. Therefore, students have difficulty doing their mathematics homework. Students will feel discouraged and frustrated if they have to solve mathematics problems at home without fully understanding the concept in class [27]. Thus, this could lead to students withdrawing from doing mathematics homework or copying homework from others. However, if teachers encouraged students to actively engage in learning mathematics during class hours, students would be able to complete their homework in less time and more efficiently [1]. Therefore, homework has to be well integrated into lessons, it should reinforce what is taught in the class to make mathematics homework interesting [14]. Hence, homework should be well integrated into lessons taught so that students will find it engaging, interesting, and useful, and eventually, it will benefit them academically.

Non-academic benefits of doing Homework

Homework helps foster lifelong learning in students by developing study habits and independent learning habits. Several studies have shown that homework has non-academic benefits. Engaging children in doing HW will have greater self-direction and self-discipline, better time management skills, and independent problem-solving skills [7, 21, 30]. Homework promotes greater self-direction and self-discipline because it is done with less or sometimes no supervision and is not bound by time constraints [1, 8]. Homework nurtures independent learning habits and makes students responsible and accountable for their own learning [10, 27]. However, Cooper in his book The Battle over Homework, mentions that cheating is one of the negative effects of homework. The author mentions that students either cheat by copying from other students or by getting help beyond tutoring [7]. Therefore, this practice may develop unethical traits in students in long run. Students may feel tempted to copy from high-achieving classmates in order to escape from negative consequences due to homework control. Thus, HW enhances students' personal traits such as time management, self-discipline, problem-solving skills and responsible, however, those students who copy might develop unethical traits such as cheating in the long run [32].

HW Management

Types of HW

Teachers play a vital role in designing and implementing homework assignments, their beliefs and perceptions will determine the type and amount of homework that is assigned to students [31]. Homework must have a clear academic aim, such as practice, assessing for comprehension, or applying knowledge, it should clearly demonstrate students' learning and encourage ownership by providing options and being relevant to them [34]. Finally, homework assignments should instil a sense of competence in students so that they can perform it successfully without assistance. Homework should have utility value such as usefulness, [15] concluded that if students believe the assigned homework is useful, it would motivate them to participate in homework, which would encourage more favourable perspectives on such participation.

Homework is classified under four instructional goals. Those instructional goals are practice, preparation, extension, and integration. Practice assignments reinforce the concepts that are already learned, helping students master the skills. Preparation assignments introduce materials to be presented in the next lesson, and extension homework involves the transfer of previously learned skills to a new situation. Finally, integration assignments aim at integrating different skills learned to produce one product [7, 8]. Drill and practice assignments seem to be the most prevalent homework

assignments [32]. However, extension homework has a positive impact on students' mathematics achievement rather than practice and preparation homework [26]. Mathematics teachers believe that teachers should assign homework with more demanding purposes (e.g., extension assignments) however, according to teachers, students need to master work habits, responsibility, and autonomy for this kind of task, or else homework may be counterproductive [28].

Teachers preferred assignments that encourage thinking and creativity, however, they also acknowledged the contribution made by drill and practice assignments in students' learning [31]. The authors suggest a balance of homework types be considered while designing homework tasks to achieve academic success. Assigning a balance of homework types will cater to the needs of diverse students, which will increase students' homework completion and enhance students' academic achievement.

HW Assessment

Assessment is an integral part of instructions, it determines whether the goal of carrying out the activity is achieved or not. Assessment practices must be deeply rooted in the instructional process, and the information teachers' yield from the assessment will indicate whether and how instruction should be modified to develop students' understandings [33]. Grading students' homework has a positive impact on their learning process [2]. Moreover, when homework becomes an integral part of a student's grade, it makes a difference in their homework completion [20]. Scholarly study have reported that formative assessment strategies in mathematics can uplift motivation by building confidence for challenging tasks, their findings revealed that students were willing to solve more complex problems in mathematics after teachers used formative assessment methods which included the use of rubrics, checklists, and self and peer assessment in the class [3]. Furthermore, formative assessment is widely recognized as a powerful integration of assessment with instruction that has great potential to improve students' learning, after analysing three different middle schools' mathematics formative assessment programs, their study showed that there is significant progress towards a more formative view of assessment, although, formative assessment is not yet the norm, it appears to be gaining a foothold [16]. However, this practice could rarely happen as it requires a lot of time. Moreover, assessing the homework and providing feedback are crucial components that have a positive impact on the HW process [15]. Thus, assessing students' homework is important because it motivates them to complete their homework, thereby improving their learning; it informs teachers about their teaching; and, most importantly, it informs teachers about the students' learning progress.

HW Follow-up

The teachers' goals for homework follow-up activities in class were to determine students' areas of learning strength and weakness, foster student engagement, and address students' math problems, however, teachers shared that the aim of checking the HW was to see students' HW completion [27]. Likewise, study on mathematics teachers' conceptions of homework feedback, found that teachers frequently do checking homework completion and checking homework on the board in the class as a follow-up activity on HW [12]. However, effectiveness of HW follow-up is affected by limitations such as large class size, time constraints and curriculum adherence. Constraints such as curriculum adherence affect the effectiveness of HW follow-up [27]. Homework follow-up is the most important component of homework practice as it will ensure students' learning after doing the homework and also provide a platform for students to clarify their doubts and misconceptions if they have any. Assigning HW without doing HW follow-up will fail the purpose of assigning HW. Thus HW follow-up is an important component of HW practice.

Homework is an important school activity that can improve students' learning achievement, and promote learning beyond school boundaries. Homework provides an opportunity for teachers to assess their instruction and ensure students' understanding. Similarly, for students, it reinforces the skills learned in the class and develops self-regulatory attributes. However, all these are possible if homework is engaging, interesting, and relevant but not beyond the student's level of competency. More importantly,

HW type and assessment of the HW task, that will determine the outcome of the homework task assigned.

Methodology:

Study Design: This study employed the convergent parallel mixed method design.

Place and Duration of Study: Both the quantitative and qualitative data were collected from higher secondary mathematics teachers of Bhutan, between December 2021 and September 2022.

This study employed a mixed-method approach, the sampling strategy for this study was simple random sampling for the quantitative approach and purposive sampling for the qualitative approach. The minimum sample size required was calculated using Taro Yamane's formula [6]. A total of 244 higher secondary mathematics teachers from 83 higher secondary schools out of 89 HSS in Bhutan [23] who are currently teaching classes nine to 12 mathematics responded to the online survey questionnaire. Of 244 teachers, 166 (68.0%) were male and 78 (32.0%) were female; Furthermore, on the basis of the areas, 75 (30.7%) teachers were from urban areas, 134 (54.9%) from semi-urban and 35(14.3%) from rural areas.

For the qualitative data, 12 teachers were interviewed, seven from the west, one each from the central and south, and two from the east. The 12 teacher interviewees were from seven higher secondary schools in Bhutan. Five focused group interviews were done with six interviewees in each group. Three of the focused groups were from grades 11 and 12 and two were from grades nine and ten. All the interviewees were from a HSS in Bhutan.

Quantitative data were analysed using descriptive and inferential analyses using the Statistical Package for Social Sciences [SPSS] version 25. Likewise, qualitative data analysis was carried out using Thematic Analysis, where the two authors proposed six phases to analyse qualitative data thematically [5].

Validity & Reliability

A pilot test of the instrument was conducted to ensure the dependability and reliability of the questionnaire items. Cronbach Alpha reliability tests were done on survey items, and those with an alpha (α) value of 0.7 or higher were recorded, while those with an alpha (α) value of less than 0.7 were deleted or amended [19].

Table 1

Reliability Test

Survey Questionnaire	Cronbach Alpha	Number of Items
Purpose of HW	.82	9
HW Management	.81	13

The Cronbach Alpha (α) value for both the survey questionnaires were above .70. Therefore, the survey questionnaires were reliable and dependable to collect the data.

Ethical consideration

Ethical considerations regarding potential harm, confidentiality, consent, and voluntary based participation was taken into consideration. The first principle in research is respect for people, which means individuals are self-governing and are capable of making decisions for themselves as long as they are given enough information to do so [13]. Therefore, the study ensured to obtain the participant's consent, briefed and explained about the study, their roles, implications and their right as participants in the study. The anonymity and confidentiality of participants were ensured and maintained at all times. To maintain anonymity of the participants, pseudonyms were used e.g. for interview teacher participants 'T' (Numbered from 1 to 12), focused group interviewee 'FG01S1' and teachers who responded to online open-ended question 'T88' (Numbered from 1 to 244).

RESULT

Purpose of Homework

Table 2

Quantitative result of the purpose of HW

Table 2 shows teacher participants' responses to the survey on the purpose of assigning homework to students.

Purpose of Homework

Items	N	Mean	SD	Level of Opinion
1. I assign homework to let students practice the knowledge and skills learned in the class.	244	4.64	0.51	Very high
2. I assign homework to students to let them explore the concepts taught in the class.	244	4.59	0.51	Very high
3. I assign homework to understand students' lack of knowledge of the subject matter.	244	3.98	0.90	High
4. I assign homework to improve students' sense of responsibility in learning.	244	4.32	0.65	Very high
5. I assign homework to increase students' academic achievement.	244	4.33	0.70	Very high
6. I assign homework to students to prepare them for the next class.	244	3.83	0.96	High
7. I assign homework to students to improve their study habits.	244	4.25	0.74	Very high
8. I assign homework to students to instil independent learning skills.	244	4.32	0.72	Very high
9. I assign homework to check the effectiveness of my own teaching	244	4.12	0.79	High
Overall	**244**	**4.26**	**0.72**	**Very high**

Level of opinion: Very low: 1.00-1.80, Low: 1.81-2.60, Moderate: 2.61-3.40, High: 3.41-4.20, Very high: 4.21-5.00 (Level of opinion adapted from Pimentel model, 2010)

The result analysis for the purpose of HW revealed that mathematics teachers strongly agreed by rating very high for academic and non-academic purposes of HW, which indicates that mathematics HW is important with an overall mean of 4.26 (SD =.72). Of the nine items, item 1 “I assign homework to make students practice the knowledge and skills learned in the class” was rated the highest with a mean score of 4.64 (SD=.51), and item 6 “I assign homework to students to prepare them for the next class” was rated the least (M=3.83, SD=.95). Thus, the primary focus of assigning HW is to reinforce what is learned in the class and preparation HW is rarely assigned.

The thematic analysis showed that teachers assign homework to students to reinforce what is taught in the class, T6 stated, “My intention of assigning homework is mainly to make students revise the topic." In addition, T5, T8 and T12 mentioned that the purpose of assigning homework was to revise and practice the lessons taught in the class.

T6 and T10 shared that HW are mostly for practice, preparation assignments are rarely given because the main focus of HW is to check the understanding of the concept taught in the class and assigning HW for the next lesson is hardly effective as students have low mathematics ability. By the same token, T1, T3 and T10 expressed that they usually assign HW to check whether students have understood the concept after delivering the lesson.

Further, T5 and T8 shared that they assigned homework to make students work independently and take responsibility for their own learning. T1 and T3 expressed that by doing HW students practice what is taught in the class, moreover, they learn to manage their time and discipline oneself in the process of doing HW.

Homework Frequency

Quantitative result of HW frequency

Figure 1

Homework Frequency

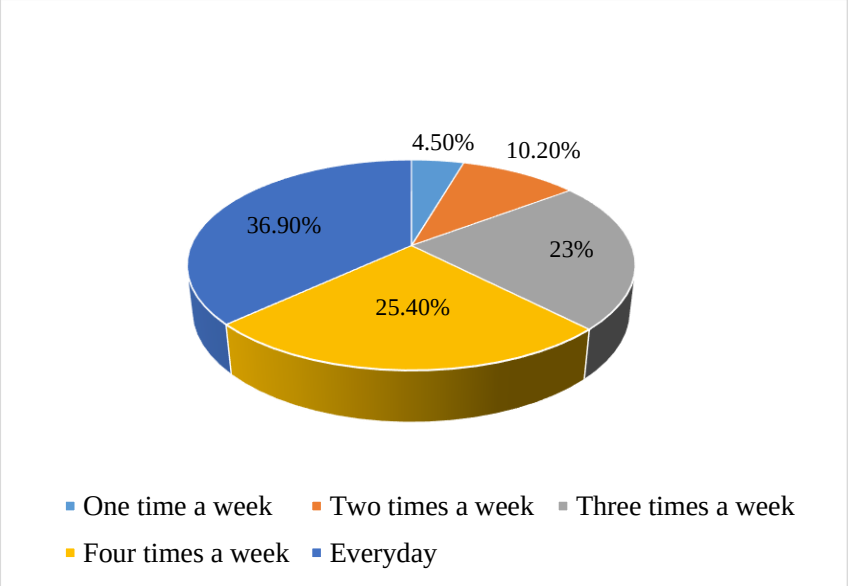

Figure 1 shows that 36.90% (90) of teachers assign HW every day, followed by 25.40% (62) of teachers four times a week, 23% (56) assign it three times a week, and 14.70 (35) assign it one or two times a week.

Table 3

Kruskal-Wallis one-way ANOVA test

Table 3 shows Kruskal-Wallis one-way ANOVA test to compare the HW frequency of higher secondary schools in urban, semi-urban and rural areas of Bhutan.

Kruskal-Wallis H Test	
	HW frequency
Kruskal-Wallis H	2.469
df	2
Asymp. Sig.	.291

a. Kruskal Wallis Test
b. Grouping Variable: Area

A Kruskal-Wallis H test indicated that there was no statistically significant difference between three groups, Urban, Semi-urban and Rural in HW frequencies (H (2) =2.469, p = .291). This indicates that the pattern of HW frequency is same in all the HSS of Bhutan.

HW Management

Quantitative result of HW management.

Table 4

Homework management.

Items	**N**	**Mean**	**SD**	**Level of Opinion**
1. I provide students with resources to do their homework when required.	244	3.66	0.83	High
2. I assign homework tasks according to students' learning styles.	244	3.54	1.03	High
3. I provide students with a choice of homework.	244	2.70	1.04	Moderate
4. I give students enough time to complete their homework.	244	4.27	0.85	Very high
5. I remind students about their homework.	244	4.43	0.72	Very high
6. I give grades/marks on students' homework.	244	3.84	0.91	High
7. I allow students to assess their peers' homework in the class once it is submitted.	244	2.90	0.96	Moderate
8. I give written feedback on students' homework	244	4.04	0.85	High
9. I motivate students by giving positive reinforcement on their homework assignments.	244	4.13	0.76	High
10. I sum up all the homework assessment grades and finally reflect them in their progress report.	244	4.09	1.03	High

11. I provide extra help to students in completing their homework after school hours	244	3.45	0.91	High
12. I call and meet with parents when students fail to do their homework.	244	2.45	0.99	Low
13. I discuss the importance of homework as helpful practice with my students and encourage them to actively engage in it.	244	3.98	0.86	High
Average	**244**	**3.65**	**0.90**	**High**

Level of opinion: Very low: 1.00-1.80, Low: 1.81-2.60, Moderate: 2.61-3.40, High: 3.41-4.20, Very high: 4.21-5.00 (Level of opinion adapted from Pimentel model, 2010)

Table 4 shows the homework management. In the context of this study, the term "homework management" refers to the way teachers in Bhutanese higher secondary schools administer their students' homework. The survey revealed a high overall mean (M = 3.65, SD =.90) for homework management, indicating that mathematics teachers are administering students' homework effectively, particularly in terms of reminding students about HW (M = 4.43, SD=.72) which was rated the highest.

Moreover, teachers have rated high on providing extra help to students in completing their homework after school hours (M= 3.45, SD=.91) However, providing the choice of homework to students (M = 2.70, SD = 1.04) was rated moderately, and meeting with parents when students fail to do their homework was rated low with a mean score of 2.45 (SD =.99).

Table 5

Item 5 and 11 in percent.

Items		Never	Rarely	Sometimes	Often	Always
5. I remind students about their homework.	Count	0	4	21	85	134
	Row N %	0.0%	1.6%	8.6%	34.8%	54.9%
11. I provide extra help to students in completing their homework after school hours	Count	1	34	96	79	34
	Row N %	0.4%	13.9%	39.3%	32.4%	13.9%

Table 5 reveals that most of the teachers (89.7%) often or always reminded students of their HW, however, not even half of teachers (46.3 %) often or always rendered extra help to students.

Figure 2

Grading and Assessing Students' HW motivates students to complete HW.

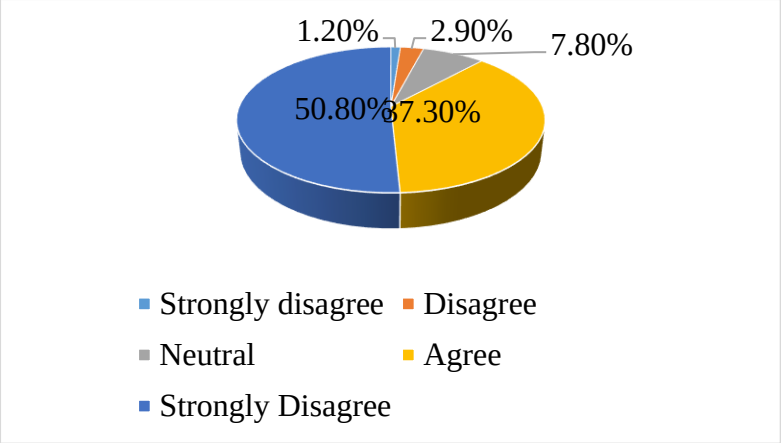

Figure 2 shows that 88.1 % of the teachers agreed or strongly agreed that grading and assessing students' HW motivates students to complete their HW.

The data on HW management showed three prominent themes; managing HW after it was brought into the class that is HW follow-up, HW task and HW assessment.

The analyses indicated that once HW was handed in, teachers either did a quick check or asked if students had done the HW or not, and some teachers spent some time clarifying the students' doubts before the actual lesson. T11 asserted, *"I usually check their work during the free period, in the class, I just run through whether they have done it or not."* Likewise, T1, T5, T6, and T9 shared that they always spend five to ten minutes clarifying the doubts from the previous day's homework. On the other hand, T12 and T10 expressed that clarifying students' HW doubts for five to 10 minutes suffices the recapitulation of the lesson. Hence, she shared that she clarifies the HW doubts before the actual lesson.

Teachers assign the same task to everyone, HW is mostly given individually, and it is always the teachers' decision to decide how much HW and what HW to be assigned. It is evident from the phrases like, *"I always give one or two questions as HW after teaching a concept"* (T6, T10), *"I give the same task to all the students"* (T3, T12, T6, T9), and *"Mostly I give individual tasks as HW"* (T11, T7, T1, T6, T10).

T9, T10, and T7 expressed that assigning HW tasks as per students' learning styles is important as it will help students to learn better and also it will curve the HW copying behaviour of the students, but it is not possible to practically apply as there are more than 30 students in a class and there is not enough time to design individual tasks for each student.

The homework assessment was found to be challenging from the analysis of the data. However, mathematics teachers do random corrections of the HW and whole class approach by solving HW problems on the board.

T6 and T10 shared that they write the answer on the board so that students could check their answers, as it is not possible to correct everyone's book because of time constraints. T9 expressed that he corrected a few books and other students referred to those answers to cross-check and validate their answers.

T3 and T9 expressed that they correct students' HW randomly since they do not have time to correct everyone's HW as the class size was large. The same view was echoed by T4 who shared, *"I randomly, check a few notebooks and then I write the answer on the board and ask them to crosscheck."*

On the other hand, T6 expressed,

Every day, correcting each and every book was not possible, but at least I made sure that every day I ask students whether they had done their HW or not, and I randomly pick a few children to see whether they had done it or not.

The teachers render help to students through social media, especially in day schools, and boarding schools, teachers usually help students during study hours, and students depend on their friends and teachers in boarding school, this is evident from the statements like “I get doubts through social media so I can sense that there are no elders at home, who are helping them with homework. I usually encourage students to ask doubts through social media” (T6)

The same echoed when T 9 expressed,

In schools like ours we can just remind students about HW through social media, we cannot reach to every student after school hours ones they are sent home, however, at this time, unlike our times, students don't have to go after the teachers to clear their doubts, we have our own Messenger, WhatsApp, and Telegram groups, I always remind them to put their doubts in those groups. So I can give some feedback and just solve the problem.

T3, T11 and T8 shared that since students are staying in the hostel, they depend on their teachers and friends to clarify their doubts while doing their HW, and teachers usually help students during study hours.

Relationship between the purpose of HW and HW management.

Table 6 presents Spearman’s correlation between purpose of homework and homework management.

Table 6

Correlation between purpose of HW and HW management.

Correlations

			Purpose	HW_management
Spearman's rho	Purpose	Correlation Coefficient	1.000	.439**
		Sig. (2-tailed)	.	.000
		N	244	244
	HW_management	Correlation Coefficient	.439**	1.000
		Sig. (2-tailed)	.000	.
		N	244	244

A Spearman correlation was conducted to examine the relationship between the two variables, the purpose of HW and HW management, the relationship was positive, moderate in strength and statistically significant (rs (243)=.439, p<.05). (See Table 7 for interpretation of correlation strength)

Regression to predict HW management based on HW purpose.

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.437a	.191	.187	5.41431

Predictors: (Constant), Purpose

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1670.752	1	1670.752	56.993	.000b
Residual	7094.183	242	29.315		
Total	8764.934	243			

a. Dependent Variable: HW_management

b. Predictors: (Constant), Purpose

A simple linear regression was conducted to predict HW management based on HW purpose. A significant regression equation was found (F (1,242) =56.993, p <.05), with R2 of .191. This indicates that the purpose of HW is not explained much in the variation of HW management despite being significant.

DISCUSSION

Purpose of Homework.

The study established that teachers assign HW with multiple purposes, however, the primary purpose of assigning HW to students was to make students practice the knowledge and skills learned in the class. This could be because teachers' focus in assigning homework is to check students' understanding of what is taught in the class rather than to have students explore beyond what is learned in the class. This finding is in agreement with the scholarly finding that reported that the main purpose of homework is to practice or review the material covered in class [29].

On the other hand, HW assigned to prepare students for the next lesson was found ineffective, owing to the students' low aptitude for mathematics, thus preparation HW is rarely assigned. Most of the time, HW assigned are simply extensions of what is being taught in class from the textbook, this is also evident from the qualitative data on the types of HW tasks assigned by the teachers in the present study. This indicated that teachers rarely plan any HW task separately and this could be another reason for hardly assigning any preparation HW. This contradicts the finding of [22] who reported that the teachers of secondary schools used homework more frequently to prepare for and enhance class lessons, as the focus of the assigning HW was to enhance learning, while elementary school teachers were more likely to use homework to review class material and go over homework in class, and the focus was to teach time management skills to students. On the other hand, homework designed with

the purpose of solving problems (extension homework that involves the transfer of previously learned skills to a new situation) has a positive impact on students' mathematics achievement rather than practice and preparation homework [29]. In light of these findings, focusing on designing and assigning homework with a purpose of practice, preparation and extension (solving problems) equally appears important to enhance students' learning.

HW is assigned to provide feedback on students' learning as well as on teachers' teaching and to instil attributes such as responsibility, self-discipline, independent learning, and time management skills in students. This finding is consistent with the studies of [37] who concluded that the purpose of homework was to reinforce what was learned in class and [35] who reported that the purpose of HW was to develop self-regulatory attributes such as learning autonomy and time management. Thus, it is evident that teachers assign HW to students to develop personal traits as well as enhance their academic learning.

Homework Frequency

The present study revealed that HW is an integral part of teaching and learning mathematics in Bhutanese schools; all the mathematics teachers assign HW to students, and the quantitative data confirms that 62.3% of mathematics teachers assign HW every day or at least four times a week, and this pattern of assigning HW is the same in all higher secondary schools in Bhutan (see figure 3). In the context of this study, assigning mathematics HW almost every day or at least four times a week, keeping in mind that there are also other subject teachers who assign HW to students, could exhaust students both physically and mentally [7] which might have a negative impact on their attitude toward school as they might find attending school too taxing and exhausting. An excessive amount of HW was associated with a negative attitude towards school [8].

Homework management

The student's motivation to complete homework is affected by the length of homework tasks and the time permitted to complete the task [20]. The present study revealed that teachers assign a few questions as HW on a daily basis as they do not want to burden and demotivate the students by giving too many questions, and students are expected to complete the task within an hour. This finding is similar to the findings of Ergen & Durmuş , who reported that teachers focused on assigning HW that took less than an hour so that the students would not be discouraged [15]. Nevertheless, in the context of this study, the number of hours spent by the students might be higher than what is mentioned by the teachers. This is because, mathematics teachers may not have considered the time spent by the students on the combined HW assigned on that particular day, moreover, the students who struggle with mathematics may take more time than expected, studies shows that students who had difficulty in school took extra time to complete their HW [8]. Thus, we can conclude that the time spent doing HW can be more than an hour. Nonetheless, teachers may consider the recommendation made by the scholars on the combined duration of homework assignments be 10 minutes in grade one and increase by 10 minutes in each consecutive grade for children to do their daily homework effectively [7,8].

The present study established that the primary goal of HW follow-up is to check students' HW completion. Some of the teachers corrected students' HW during their free periods, in the class, they just checked if students had done their HW or not. Most of the teachers believed that it was not possible to assess every student's HW because of time constraints. A similar conclusion was drawn by the findings of Ergen and Durmuş who found that some teachers only checked whether the students had done the homework or not since the feedback process took a lot of time [15]. However, the concern here is that students won't be able to correct their mistakes if the assessment is not done, which could result in incorrect learning. The same concern was revealed in the present study by the qualitative data of the students. On the other hand, assessing the homework and providing feedback are crucial components that have a positive impact on the HW process [15]. Hence, it is evident that HW assessment is a challenge and that it might have a negative impact on the HW process as well as on students' learning.

Ownership is one of the components of effective HW and it is developed by providing options and making HW tasks relevant to students [34]. However, the present study found that every student is assigned the same HW tasks; it is the teachers who decide how much and what kind of task to assign. It was found that individualizing HW tasks was challenging because of the large class size. Some of the possible reasons could be the vast syllabi that they have to cover in a year, and the different grade levels teachers have to teach. This finding is consistent with the previous study done by [29] who reported that individualising tasks as per the needs of students was found challenging, although the teachers found it valuable.

The quantitative data revealed that most of the teachers (89.7%) often or always reminded students of their HW. However, not even half of the teachers (46.3 %) often or always rendered extra help to students (see Table 5), the qualitative data revealed that some teachers clarified students' HW doubts through social media such as WhatsApp, Telegram, and Messenger, especially in day schools, as they could not reach students once they were sent home. Nonetheless, the help rendered through social media may not reach all students, as the use of social media facilities depends on affordability. Hence, students who come from economically disadvantaged families may not be able to use this facility. Therefore, students may not receive the teachers' required help while doing HW.

Relationship between HW purpose and HW management.

A significant positive correlation was found between the purpose of HW variable and HW management variable (see Table 6) hence, the HW management of the teachers is positively associated with the purpose of HW. This indicates that the HW purpose guides the HW management. This finding aligns with the findings of Xu and Wu who found that HW management was positively associated with learning-oriented reasons such as opportunities to get good grades, practice skills, develop a sense of responsibility, and learn to work independently [37].

However, the regression analysis (see Table 7) showed that HW purpose does not explain much about HW management, as the predictive value is only 19.1%. Therefore, we can conclude that although teachers have a strong purpose for assigning HW to students, it does not predict the effectiveness of HW management since HW purpose does not explain much about HW management. This could be due to limitations such as time constraints and large class size, and as a result of these limitations, the effectiveness of HW management is compromised although teachers might have a strong purpose in assigning HW. [27] found that constraints such as curriculum adherence affect the effectiveness of HW follow-up.

CONCLUSION

Homework is an instructional practice that has been found to improve students' learning. The study found that teachers have strong academic and non-academic purposes of assigning HW to students however, it was focused more on reinforcing students' learning, thus the HW was assigned to revise, revisit, and practice the skills and knowledge learned in the class. The non-academic purpose focused on developing responsibility, self-discipline, time management, and independent learning skills in students.

The majority of teachers assign HW every day or at least four times a week, and students are expected to finish within an hour. HW overload was found to be an issue, and it is because different subject teachers assign HW at the same time. A homework "timetable" appears important here as suggested by [30], so that students would not be overburdened with HW. The HW assessment was found challenging because of the large class size and time constraints. Thus, large class size and time constraints are barriers to the effective management of HW.

The study also established that there is a positive significant correlation between HW purpose and HW management and however, the predictive value of HW management variable by HW purpose variable is 19.1%.

Recommendations

School management and mathematics teachers may consider having a HW policy that will ensure assigning the right amount of HW (HW frequency). This will possibly address issues like HW overload and HW completion.

Future research could be conducted on this topic using a qualitative design, a new avenue of homework practices, to reveal an in-depth understanding of mathematics HW practices such as HW design and HW follow-up by students, with a greater emphasis on classroom observations to learn about the reality of HW implementation and management and unfold the best practices of HW.

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