

# NATIONAL ASSESSMENT FOR READING AND NUMERACY

(GRADE 3)

# 2020



Government of Nepal  
Ministry of Education, Science and Technology

Education Review Office (ERO)  
Sanothimi, Bhaktapur

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## **National Assessment for Reading and Numeracy 2020**

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## Forewords

The National Assessment for Reading and Numeracy (NARN) has been completed in 2020 with an objective of finding the minimum learning status of students of Grade Three. As a sample, total of 7024 students from 580 schools have participated in this assessment. In order to generalize the results in each province, a national and provincial representative sample was selected using statistical method-Probability Proportional to Size (PPS). Similarly, Sub-sample were drawn for the individual assessment.

Also known as NARN test, assessment of this kind is the first experience in Nepal although we have good deal of experience in administration of different national assessments such as CBEGRA, EGRA, EGMA and NASA.

Present shape of the report is a grand output of different sets of exercises that include preparation as well as finalization of test items with piloting, test administration and report writing through analysis of test results. According to the working arrangement, EGR-RTI was requested to undertake two sets of exercises- preparation of test items and report writing which were successfully completed. In the same way, ERO took over the role of test administration which was diligently completed by mobilizing expert services of a consulting agency named MULUNG Foundation, Nepal.

The NARN test has succeeded in revealing the basic skills acquired by the children of Grade Three in reading and numeracy skills. This report clearly highlights various aspects of reading such as speed, accuracy, listening, comprehension, decoding, amount of learning and the relevant deficiencies. In addition, children's knowledge of mathematics- basic mathematical operations, identification of basic shapes in geometry, time and daily skills have been studied and plenty of data has been discovered on the overall achievement of students in those aspects.

During the whole course of this assessment project, contribution of wide range of agencies and people is seriously acknowledged. Specifically, I must thank EGR-RTI, particularly the team combining Narayan Krishna Shrestha, Sagar Neupane and Swadesh Maharjan, for taking a lead in two major stages of this venture with international technical assistance. MOLUNG Foundation is another agency that deserves our appreciations for the consulting services. We do remember invaluable co-operations of those experts, schools, teachers and students who participated in this national assessment. Likewise, we are truly thankful to the MOEST, central level departments, relevant District Education and Coordination Units as well as Education Units of local governments that proved to be major actors in providing supportive energy to our entire undertaking. In the same way, I should recognize serious efforts made in coordination and quality assurance while conducting the whole cycle of this assessment by an ERO team comprising Uttar Kumar Parajuli, Shyam Prasad Acharya and Deviram Acharya.

Finally, we intend to bring to the notice of all categories of reader community that present NARN an integrated test of Nepali language (Reading

skills) and Mathematics (Numeracy skills) which might lay credible foundation for creating data useful for reporting to comply with Global Proficiency Framework under relevant goal of Sustainable Development Goal (SDG). Lastly, we honestly welcome constructive advice and criticism of the readers useful for improving an assessment of this kind in future.

Shiba Kumar Sapkota  
Director General

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# CHAPTER I: INTRODUCTION AND STUDY METHOD

## 1.1 Background

Education Review Office (ERO) conducts the National Assessment of Student Achievement (NASA) to identify the existing status of learning achievement of students at the end of grades five, eight, and ten. As a large-scale assessment, ERO assesses the NASA study in a large sample size ensuring the statistical representation of the sample to both national and sub-national (Provinces) levels. This national-level student assessment aims to produce objective, accurate, and comparative information on students' achievement in schools. However, NASA is not limited only to assessing students' achievement, but also to serve as a tool to evaluate the entire education system of the country.

ERO has already conducted a NASA study to identify the learning achievement of Grade 3 students in 2015. The major objectives of this NASA study were: to identify the learning level of Grade 3 students in Mathematics and Nepali against the national curricular goals; to create a reliable database on the learning level on those subjects for benchmarking; to compare them with earlier achievements to monitor the progress over time; and to generate recommendations for policymaking to improve learning level of students (ERO, 2015).

Although NASA provides information regarding the status of students' learning achievement, it does not assess explicitly the literacy knowledge. In other words, NASA is based on curricular competencies and goals, but not on the specific skills that are required for literacy-reading and numeracy. The acquisition of literacy skills in the early grades is important for students' success in the later grades. In this context, the assessment of Reading and Numeracy receives center stage.

There are different approaches to literacy assessment in the early grades. Early Grade Reading Assessment (EGRA) has been a popular model to assess literacy in Grades 1, 2, and 3, globally. It has been designed and implemented to assess basic reading skills (RTI, 2011). The original purpose of the EGRA is "to carry out the sample-based national or system-level diagnostic measurement. It aims to examine gaps in reading competencies among students to inform education ministries and partner agencies regarding system needs for improving teacher professional development and pre-service programs" (ACER, 2012). Two other practices of literacy assessment include Group Administered Literacy Assessment (GALA) and Classroom-based Early Grade Reading Assessment (CB-EGRA). While EGRA administers tests to individual students, GALA and CB-EGRA tests reading in a group. Yet, all these tests do not assess numeracy skills as part of literacy. By realizing the importance of early grade literacy in mathematics, many countries have conducted Early Grade Literacy Assessment in different names. Early Grade Mathematics Assessment (EGMA) is one of them. The focus of this tool lies in the early years of mathematics learning

emphasizing numbers and operations and on geometry through second grade or, in developing countries, perhaps through third grade (EGMA, 2014).

Nepal's National Education System Plan (NESP, 1971) introduced a systematic curriculum framework in school education in which mathematics was introduced as one compulsory subject throughout the school education. Primary level education consisting of grades 1, 2, and 3 formed the primary school, and the subject of mathematics "Ganita" mainly aimed at developing mathematical literacy of reading, writing, and arithmetic shortly abbreviated as Three R's. Since then many revisions have been made in curriculum, curricular materials, and teacher training to achieve expected outcomes in mathematics (ERO, 2018).

Many assessments/ tests have been conducted at different levels, but the national level assessment has not been made to assess primary level students' literacy in mathematics. School Level Certificate Examination (SLC Exam) was the only national level examination taken at the end of school education. Unsatisfactory results in mathematics became an issue for a long time because it attributed to the increasing failures in the SLC examination. The sound basis of mathematical background at elementary grades might be the main reason. But due to the lack of such specific information on their background, no specific remedy could be made (ERO, 2018). Assessment of early grade literacy of mathematics can provide useful information in this direction. Therefore, the National Assessment for Reading and Numeracy (NARN) has assessed both literacy and numeracy (mathematics) competencies of early grade children.

## 1.2 Purpose and Objective of the NARN

ERO conducted the NARN with the purpose to identify the existing status of Grade 3 students' reading and numeracy skills with the following objectives:

- 1 To understand the present students' achievement status and to understand the basic skills of students in Reading and Numeracy
- 2 To understand the students' socio-demographic and economic factors that affect students' achievement in Reading and Numeracy
- 3 To understand the relationship between schools' background variables and students' performance in Reading and Numeracy
- 4 To identify the headteachers' background variables and the students' performance in Reading and Numeracy
- 5 To extract recommendations based on the data for further policy reform and needed interventions.

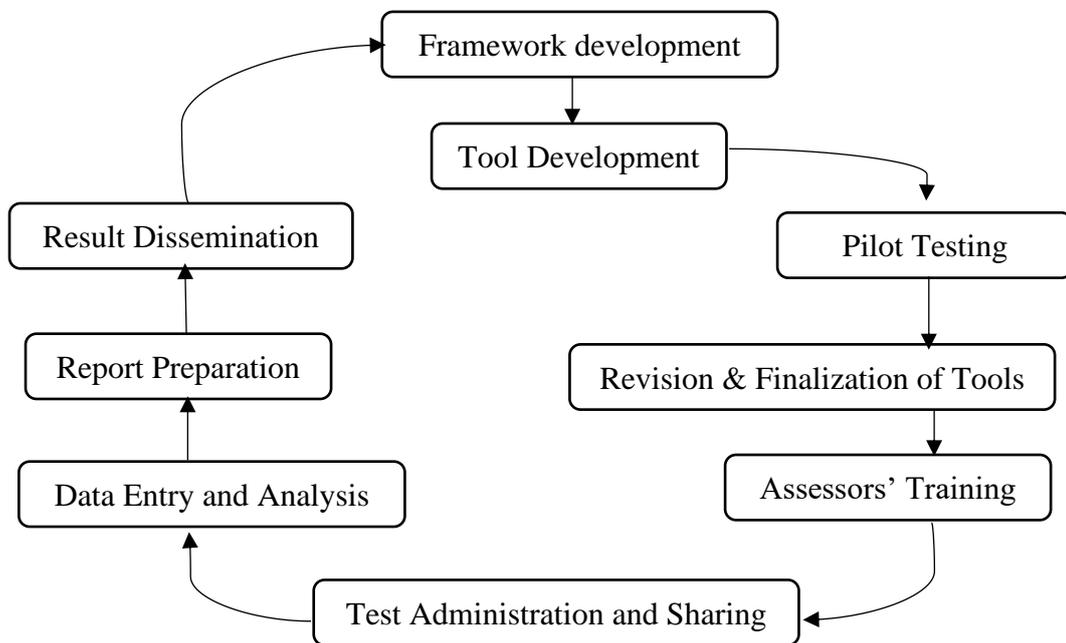
This national assessment for Reading and Numeracy was conducted with an assumption that the literacy and numeracy skills acquired at the school level largely determine the young people's prospects of succeeding in further education and prepare them for better adult life. Therefore, the personal development of an individual and educational status of the country largely depends on knowledge, skills, and understanding acquired by citizens in the early grades. In this regard,

understanding what and how students are learning at school is one of the important concerns for all parents, teachers, and the public. With this realization, ERO had aimed to conduct this NARN to understand how well the school education system has equipped the young students with knowledge and skills they need for better education and to be able to face future challenges. The measurement of students' skills is also essential for tracking the development of education and assessing the effectiveness of educational policies and practices (Hanushek & Rivkin, 2010). Measuring students' skills is important not only for determining the existing level of literacy and finding the gaps but also for providing feedback to improve the quality of learning.

### 1.3 Assessment Cycle

The NARN cycle begins with the development of the assessment framework and continues with the preparation of assessment tools, piloting, revising, and finalizing the tools, training of assessors, administration of test and sharing of results, data entry, and analysis, report preparation, and dissemination of the results. Figure 1 shows the steps of the cyclic process of NARN.

Figure 1. NARN Assessment Framework



Adopted from ERO (2017)

### 1.4 Assessment Methodology

NARN is the national assessment with the focus to assess Reading and Numeracy literacies at the end of early grades. The assessment was group administered by the trained assessors; however, to capture the Oral Reading Fluency (ORF) or Correct Word Per Minute (CWPM) and Basic Numeric Concepts the one-to-one assessment was made on a sub-sample basis from each sampled school.

## 1.5. Population and Sample

The study was conducted only in community schools including Madarasa, Gumba, Gurukul, and community-managed schools. Thus, all the community schools running grade three i.e 15820 schools were the total population of the study. The total units of the population were first divided into seven Provinces. The Provinces were the explicit strata of the study. However, while developing the sampling frame, we discarded the schools that had less than five students in grade three to maximize resource utilization. We adopted the Probability Proportional to Size (PPS) sampling method to draw the sample schools for the study.

As stated earlier, Provinces were our explicit strata. So, we ensured the statistical and other socio-demographic diversity representation of students from each Province. For each school, by using the last NASA data, we confirmed that the number of sample students from each school was 15 to optimize the statistical precision and to generalize the result in each stratum. By using the PPS sampling strategy and using students' assessment sampling technique, we calculated 97 schools for Province 1, 91 for Province 2, 82 for Bagmati Province, 82 for Gandaki Province, 82 for Lumbini Province, 65 for Karnali province, and 81 for Sudurpachim Province. Moreover, we additionally calculated 4% non-response and 4% replacement schools in each province. We calculated the count of replacement schools and identified them in each district to ensure the representativeness and sufficiency of the data in case we could not reach the sampled schools due to different circumstances including school merging, unexpected holiday, and school closure or natural calamities or hardship during the data collection days.

After calculating the size of the sample schools, we used the PPS sampling method to select the schools for the study. The PPS sampling method is a random sampling method in which the probability of selecting a bigger school is higher than that of the smaller schools. We also used one another exclusion criteria to select the sample schools. If we got less than five schools as sample schools in a district, we adjusted the school numbers in the adjoining district to optimize the resources that would be used for the assessment including time, money, and human resource.

Having done these all, we finally sampled 580 schools from 33 districts calculated the sample size as 8700 for the group assessment. However, due to the difference between the EMIS data and the actual students in the schools, we were able to reach 7433 students for the group assessment. The figure is also sufficient to generalize with a precision level that is expected before conducting the NARN.

We sub-sampled the students from each sampled school to conduct a one-to-one oral assessment. From each sampled school, we randomly selected five students for the assessment. However, if schools had five or fewer students present on the day of the assessment, we one-to-one assessed all the students.

The following are the districts that we selected as the sample district for the study.

Table 1. The sample number of schools for the study

Province	Districts (district code)	Number of schools
Province 1	Bhojpur (10)	15
	Jhapa (04)	23
	Solukhumbu (11)	14
	Sunsari (06)	23
	Udayapur (14)	22
Province 2	Bara (33)	23
	Mahottari (18)	24
	Rautahat (32)	22
	Sarlahi (19)	22
Bagmati	Chitawan (35)	18
	Dhading (30)	16
	Kathmandu (27)	20
	Nuwakot (28)	15
	Sindhupalchok (23)	13
Gandaki	Gorkha (36)	17
	Kaski (40)	16
	Nawalparasi (48)	17
	Parbat (44)	16
	Tanahu (38)	16
Lumbini	Banke (57)	20
	Dang (56)	15
	Kapilbastu (50)	16
	Palpa (47)	13
	Rupandehi (49)	18
Karnali	Dailekh (60)	14
	Jajarkot (61)	11
	Jumla (63)	9
	Rukum Paschim (54)	12
	Surkhet (59)	19
Sudurpaschim	Achham (69)	18
	Bajhang (68)	17
	Dadeldhura (73)	20
	Kailali (71)	26
<b>Total number of schools in the sample</b>		<b>580</b>

## 1.6. Modes of Assessment

Two modes of assessment were conducted for the NARN. The group test was to assess the overall Reading and Numeracy achievement skills. There was a total of 13 different sub-tasks in the assessment tool where five sub-tasks with a total of 15 items to assess the Reading Skills and seven sub-tasks with a total of 23 items to measure the Numeracy Skills of grade three students. The group test was followed by a one-to-one assessment to measure oral reading fluency, reading comprehension, and basic numeracy skills.

## 1.7 Test Administration and Data Quality Assurance and Data Analysis

The assessor training was the cascade model. First, Master Training of Trainer (MToT) was conducted at the central level. To ensure consistency among the assessors, several rounds of discussion were made, and a guideline was developed to support the trainers. The same trained assessors provided training to the teachers at the provincial level.

The assessor facilitated the students to take the test. The overall timing of group administration was about one hour, and the one-to-one test was less than ten minutes per student. The assessment tools also included the background information questions which were filled by the assessor by taking supports from the headteacher, class teacher, and by studying the class attendance register. MoEST, ERO, CLAs along with EGRP and other development partners monitored the process and ensured the assessment was going well as expected.

ERO hired one of the consulting firms to collect the data and enter the data into the prescribed template. ERO time and again supported the firm to ensure the quality of the data by providing a macro-based data entry platform developed by using MS Access. ERO also made a sample-based data quality check of the entered data to ensure the correctness of assessment copy checking, data entry, and database preparation. Further, ERO and EGRP II cleaned the data obtained from the consulting firm by developing the data cleaning protocol.

Thus, cleaned data was further recoded into different variables and imported to the SPSS-25 software to analyze the data. The Complex Sampling Analysis Plan (.csaplan) file was first developed based on the sampling strategy and complex sampling analysis was done to produce the result from the data.

The weighted analysis was to generalize the result from the sample to the population. The results are presented and analyzed in the descriptive form such as table and graph and to infer the data from the sample to the population, the standard error of the averages is shown for most of the findings.

## CHAPTER II: DATA PRESENTATION AND FINDINGS

The data collected from the field are first entered into the given database template. We cleaned the entered data is further exported to SPSS 25 for the analysis. We used the complex sampling analysis techniques- the weighted analysis to extract the meaning from the data. While analyzing the group assessment data, we separately summed the reading items and numeracy items together and hence we calculated the overall reading score and numeracy score. Similarly, we separately analyzed the one-to-one assessment data. For the separately present the data of group-test and one-to-one test for each of the school-related, students related and headteacher related variables. For all the sub-task, we calculated the average percent score. However, for the Correct Word Per Minute (CWPM)/ the Oral Reading Fluency (ORF), we did not convert it into the percentage, we simply expressed it into the value average. For most of the tables, the average values are presented along with its standard error to make readers easy to generalize the result into the population.

### 2.1 Students overall achievements in reading and numeracy

A total of 15 items were used to assess the overall reading skills whereas 23 items were there in the numeracy part of the assessment for the group-assessment. Table 2 shows the overall reading and numeracy scores in the average percentage. On average, each student was able to solve about 43.5% of the reading-related problems whereas the achievement in numeracy is about six percent point less than that of reading achievement i.e. 37.22%.

Table 2. Overall achievement in reading and numeracy

Skills	Assessment Type	Est. Population	N	Achievement in Percentage	
				Average	Standard Error
Reading	Group Assessment	332139	6815	43.53	0.82
Numeracy	Group Assessment	345950	7024	37.22	0.98

We have presented students' overall achievement in one-to-one assessment in table 3. Table 3 presents that students can read about half of the given non-words (48.99%). The average ORF of the students is 25.04. From the same text that was used to measure ORF, students were asked to answer five questions. The students score in the Reading Comprehension is 47.68%. This means each of the students was able to answer about half of the given questions correctly. Students were asked to identify the numbers, arrange the numbers into the ascending or descending order, and to identify the place value of the given numbers to measure the Number Knowledge. The average score in the Number Knowledge was more than 60% (61.30%). The data reveals that most of the students are aware of the currency notes (average percent score= 89.31%) and they even can sum at least three notes together easily (average percent score= 81.51%).

Table 3. Students achievement in one-to-one assessment in reading and numeracy

Sub-tasks	Assessment Type	Average	Std. Error
Non-Word Reading (n= 10)	One-to-one Assessment	48.99	1.21
Oral Reading Fluency (n=60)	One-to-one Assessment	25.04	0.62
Reading Comprehension (n=5)	One-to-one Assessment	47.68	1.11
Number Knowledge (n=3)	One-to-one Assessment	61.30	1.00
Currency Identification (n=3)	One-to-one Assessment	89.31	1.04
Summing Different Values of Currencies (n=1)	One-to-one Assessment	81.51	1.05

### 2.1.1 Students overall achievements in reading and numeracy

The reading score consists of five different sub-tasks: Sentence Reading, Listening Comprehension, Reading Comprehension, Vocabulary, and Dictation. For each of the sub-task, there were three items and thus a total of 15 items were to assess the reading ability of the students. Similarly, for the numeracy part, a total of seven sub-tasks were used to assess numeracy skills. Tables 4 and 5 give the achievement of students in reading and numeracy disaggregated by the sub-task.

Table 4. Achievement of students in Reading by sub-tasks

Sub-task	Est. Population size	Achievement in Percentage	
		Average	Std. Error of Mean
Sentence Reading (Items= 3)	364721	50.26	0.86
Listening Comprehension (Items= 3)	364721	47.18	1.01
Reading Comprehension (Items= 3)	364721	48.76	0.94

Sub-task	Est. Population size	Achievement in Percentage	
		Average	Std. Error of Mean
Vocabulary (Items= 3)	364721	56.03	1.29
Dictation (Items= 3)	364721	22.79	0.93

Table 4 indicates that students performed well in vocabulary with an average percent score of 56.03% whereas the students felt the dictation sub-task as the hardest one with an average percent score of 22.79%. For the remaining sub-tasks, the average score of each student was around 50%.

A similar tendency was observed in the Numeracy sub-tasks. Table 4 clearly shows that the student average score in Geometrical Shapes Identification is the highest among all the other sub-tasks. On the other side, students felt the Fraction sub-task was the hardest one with an average percent score of 22.54%.

*Table 5. Achievement of students in Numeracy by sub-tasks*

Sub-task	Est. Population size	Achievement in Percentage	
		Average	Std. Error
Geometrical Shapes Identification (Items= 3)	364721	50.76	1.07
Identification of Angle and Side (Items= 2)	364721	44.99	1.05
Number Identification (Items = 3)	364544	33.80	1.05
Use of Arithmetic Signs (Items= 8)	364373	36.34	1.04
Fraction (Items =3)	364490	22.54	1.17
Clock Reading (Item= 1)	364688	35.25	1.19
Daily Life Mathematics (Items=3)	364624	40.23	1.27

Table 5 further reveals that students were fine with the Geometry sub-task. When it comes to the arithmetic sign use to solve the problem, each student was able to solve

only one-third of the given problems related to this sub-task (36.34%). We noticed the same level of students while they solve Clock Reading related problem. Only 35.25% of students were able to solve a problem related to this sub-task on an average.

## 2.2 Students' Socio-demographic Characters and Achievement

We further analyzed the group achievement scores in Reading and Numeracy as well as achievement in one-to-one assessments by considering the students' socio-demographic characters. The socio-demographic characters that we used in this report are:

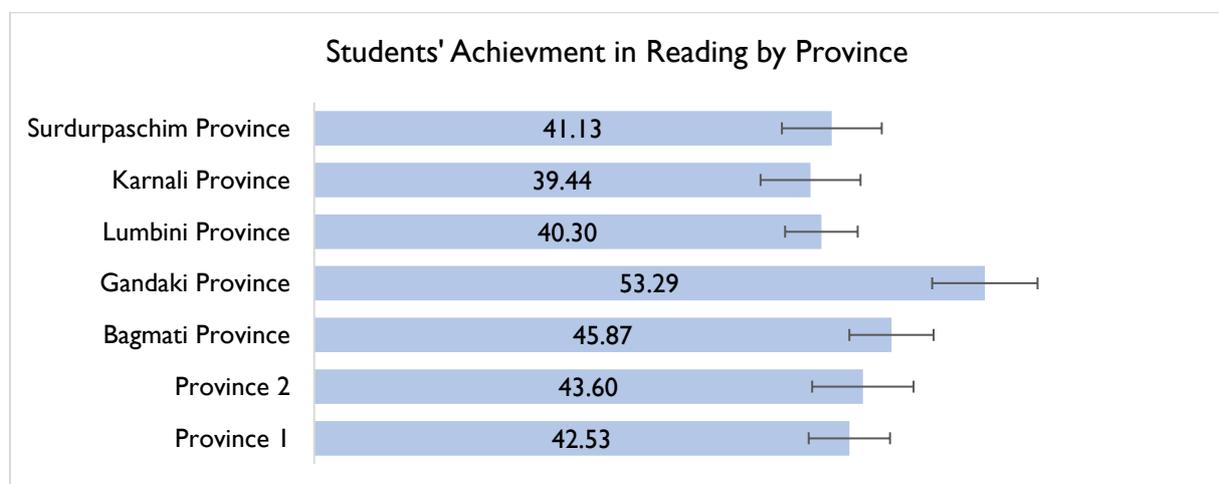
- a) Address (Province) of the student
- b) Sex of the student
- c) Age
- d) Home language

For most of these characteristics, the achievement differs for both Reading and Numeracy.

### 2.2.1 Achievement by Province

For Reading, we noticed a wide range of achievements for different Provinces. The achievement score for each of the Provinces is presented in figure 2. Figure 2 uncovers that students from Gandaki Province are better than students from other Provinces. The difference is statistically significant when compared to Sudurpachim, Karnali, Lumbini, Province 2, and Province 2. Comparatively, students from Karnali Province performed weaker than any other province. However, it was only significantly less than that of Gandaki Province.

Figure 2. Students' Reading Achievement by Province



For Numeracy, a similar pattern was noticed although the achievement score for each of the Provinces is lower than that of Reading. For numeracy, students from Province

2 were found better than that from any other Provinces with an average score of 45.97%. Students from Karnali and Sudurpachim Provinces showed the same ability in Numeracy with an average percent score of 25.15%, the least among all the Provinces.

Figure 3. Students' Numeracy Achievement by Province

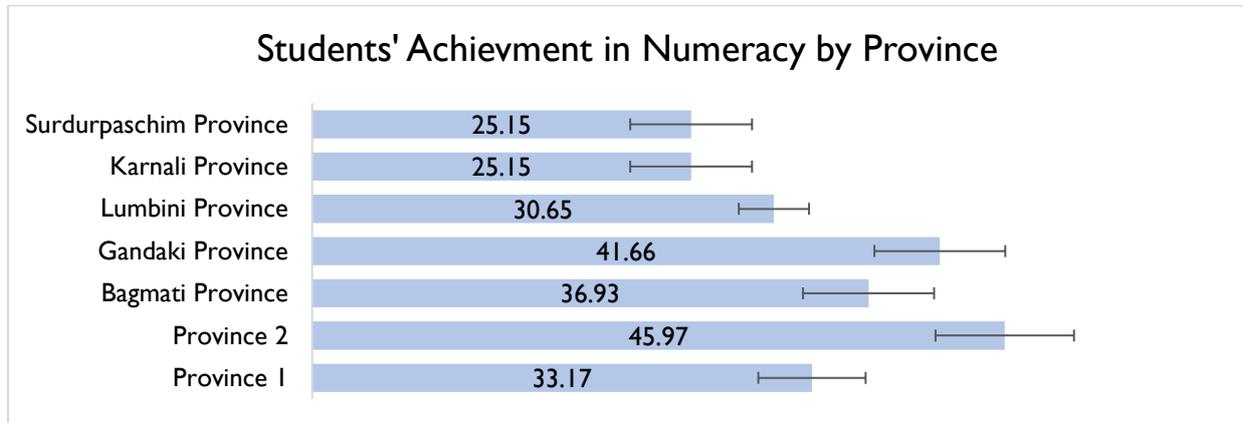


Figure 3 further unfolds that the students from Gandaki and Province 2 are significantly better than students from other provinces. Although students from Bagamati Province were found better in comparison to the students from Sudurpaschim, Karnali, Lumbini, and Province 1, we do not find the difference of score among these Provinces statistically significant.

We noticed a different scenario while analyzing the one-to-one assessment data. The wide range of non-word reading among the Provinces was quite surprising to us. We found students from Province 2 performed the best with an average percent score of 55.30 whereas students from Province 1 only scored 34.24% in the same sub-task. The Oral Reading Fluency of students from Sudurpachim Province was found the highest with an average CWPM 29.14 whereas it was least for the students from Province 2 with an average CWPM 22.31.

Table 6. Students' achievement in Reading and Numeracy in one-to-one assessment by Province

Sub-task	Province 1	Province 2	Bagmati	Gandaki	Lumbini	Karnali	Sudurpaschim
Non-Word Reading (n= 10)	34.24	55.30	43.02	56.64	48.11	51.78	52.78
Oral Reading Fluency (n=60)	23.61	22.31	26.61	28.45	22.82	26.85	29.14
Reading Comprehension (n=5)	46.83	52.60	47.41	44.94	47.24	40.31	48.72
Number Knowledge (n=3)	59.05	67.92	68.50	62.87	58.96	49.22	54.45
Currency Identification (n=3)	96.01	92.13	93.22	96.18	90.42	60.64	85.06
Summing Different Values of Currencies (n=1)	73.49	91.15	82.79	75.12	86.46	68.78	80.22

Similarly, table 6 reveals that students performed nearly the same in the Reading Comprehension sub-task with the lowest score of 40.31% from Karnali and the highest from Province 2. It is quite surprising that students from Province 2 had the least ORF whereas it was highest for Reading Comprehension. From the Numeracy one-to-one assessment, we noticed that students from Province 2 were best among other students in Number knowledge and Summing Different Values of Currencies whereas students from Sudurpaschim Province performed least with an average of 54.45% in the Number Knowledge sub-task. We are amazed to know that students from Karnali Province were far behind than students than other Provinces in Currency Identification with an average score of only 60.64% as other students from other Province scored at least 85.06%. The values clearly indicate that students from different Provinces have a diverse ability in reading and numeracy.

### 2.2.2 Achievement by Sex

We have presented the achievement of students disaggregated by sex in Table 7. Table 7 unfolds that it is not statistically significant in the difference in achieving in Reading for boys and girls. However, in numeracy, table 6 reveals that boys are better than the girls with average scores of 39.11% and 35.92% respectively.

Table 7. Achievement by sex (group assessment)

Skill	Boys			Girls		
	Est. Population	Average	Std. Error	Est. Population	Average	Std. Error
Reading	150318	43.65	0.89	179377	43.77	0.90
Numeracy	157792	39.11	0.99	185524	35.92	1.09

However, we did not see a significant difference in the achievement of boys and girls in a one-to-one assessment. Table 8 shows that in none of the sub-task, the difference between boys and girls and boys is statistically significant.

Table 8. Achievement by sex (one-to-one assessment)

Sub-task	Boys		Girls	
	Average	Std. Error	Average	Std. Error
Non-word reading (n= 10)	49.46	1.54	48.33	1.43
Oral reading fluency (n=60)	24.67	0.78	25.42	0.71
Reading comprehension (n=5)	46.71	1.42	48.49	1.28
Number knowledge (n=5)	60.46	1.30	61.90	1.31
Currency identification (n=3)	89.12	1.30	89.38	1.26
Summing different values of currencies (n=1)	82.23	1.31	80.81	1.40

### 2.2.3 Achievement by Age

It was interesting to know that the students whose age is more than the grade three official age i.e. more than eight years achieved better than the students with grade three official age or less in both Reading and Numeracy. We have presented achievement by age in a group test in figure 4.

Figure 4. Achievement by age (group-assessment)

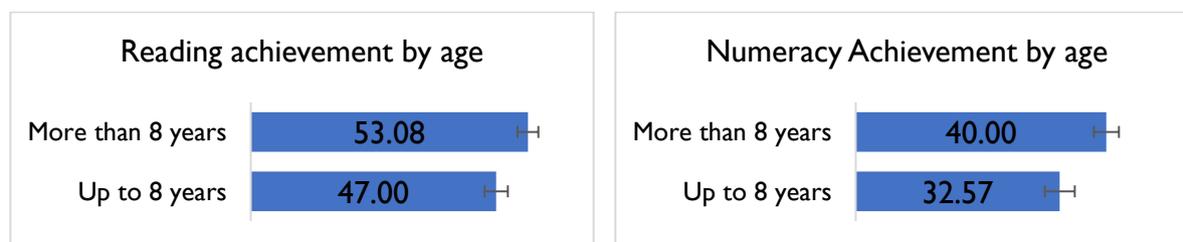


Figure 4 indicates that for both Reading and Numeracy, students with higher aged achievement better, and the difference in achievement between these two age groups is statistically significant.

We have presented the achievement different by age in one-to-one assessment in table 9. Table 9 clearly visualizes that reading non-meaning words does not differ with age. However, students with higher age performed significantly better in Reading Comprehension in comparison to the grade three official age or less (up to 8 years). In Numeracy sub-tasks including Number knowledge, Currency Identification and Summing Different Values of Currencies, the lower aged students (up to 8 years) have achieved lower than that of higher aged students (more than 8 years).

Table 9. Achievement by age (one-to-one assessment)

Sub-task	Up to 8 years		More than 8 years	
	Average	Std. Error	Average	Std. Error
Non-Word Reading (n= 10)	47.79	1.83	49.33	1.42
Oral Reading Fluency (n=60)	24.50	0.95	25.48	0.72
Reading Comprehension (n=5)	42.96	1.63	48.70	1.27
Number Knowledge (n=5)	57.17	1.78	62.43	1.14
Currency Identification (n=3)	87.59	1.81	90.69	1.05
Summing Different Values of Currencies (n=1)	76.06	2.03	82.86	1.16

### 2.2.4 Achievement by Home language

Home language is one of the major characteristics of children that significantly affect the reading achievement of the students. By figure 5, and table 10 we have unfolded the effect of home language on students' achievement. L1 students whose home language is Nepali are usually found more privileged than the L2 students with non-Nepali home language in reading as most of the schools follow Nepali as the medium of instruction. However, this gain of L1 over L2 is not statistically significant. It was surprising for us that in contrast with Reading achievement, L2 students (41.83%) scored significantly better than L1 (35.04%) in Numeracy.

Figure 5: Achievement by Home Language (group assessment)



We found Students with L1 home language are better in all the reading-related tasks. We noticed a remarkable difference in ORF and reading comprehension. The one-to-one assessment unfolds that students with L1 students are significantly better than the L2 students. The gap between L1 and L2 in their ORF is about seven percent point.

Table 10. Achievement by Home Language (one-to-one assessment)

Sub-task	L1		L2	
	Average	SE	Average	SE
Non-Word Reading (n= 10)	49.65	1.57	46.73	1.83
Oral Reading Fluency (n=60)	27.58	0.70	20.64	1.02
Reading Comprehension (n=5)	49.10	1.18	44.91	2.14
Number Knowledge (n=5)	60.89	1.20	62.47	1.80
Currency Identification (n=3)	88.75	1.30	92.79	1.30
Summing Different Values of Currencies (n=1)	79.92	1.26	84.17	1.70

From table 10 we further find that students with L2 home language are better in each of the numeracy sub-task. However, the difference in the average percent score between L1 and L2 is not statistically significant.

## 2.3 Home environment and Achievement

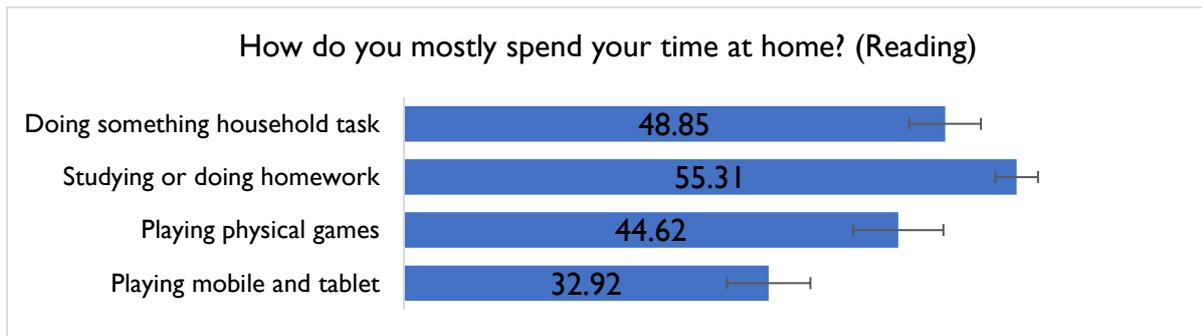
We noticed the home environment of the children played a vital role in their achievement. Students with a better learning environment at home have achieved better than students who do not have a good environment. For the study we have explained the effect of following home environment-related variables in students' achievement:

- a) Students' home time utilization
- b) Persons who support at home
- c) Availability of learning materials at home
- d) Parents' ask questions about what their children are doing at schools
- e) Parents visit schools to know their children's learning at school

### 2.3.1 Students' home time utilization and achievement

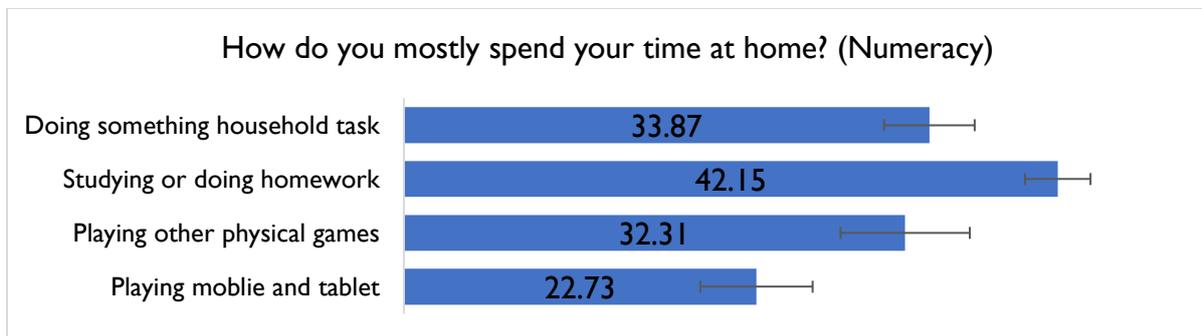
Students were asked how they mostly spend their time at home. Based on their habit of utilization of home time, we calculated the achievement. Figure 6 clearly reveals that playing mobile and tablet at home has scientifically limited students' achievement in reading (average percent score = 32.92%). Students who study or do homework at home have achieved the highest in Reading (55.31%).

Figure 6. Students' home time utilization and achievement (Reading)



A similar result was noticed in Numeracy. In the Numeracy too, students who spend their time at home playing mobile and tablet did not do well. Students who study or do homework at home have significant achievement better (42.15%) than other students who do something else than studying.

Figure 7. Students' home time utilization and achievement (Numeracy)



We observed a similar tendency in the one-to-one assessment as well. Students who read or do homework at home have achievement more in all the sub-tasks. It was interesting for us to know students who support their parents in doing different household tasks have a better knowledge of summing the currencies with an average of 83.44% in comparison to students who utilize their time at home in other ways (Table 11). For other Reading and Numeracy sub-tasks, we noticed that students who play with mobiles and tablets were lagging than other students who spent their time doing other things.

Table 11. Students' home time utilization and achievement (one-to-one assessment)

	Playing mobile and tablet	Playing physical games	Studying or doing homework	Doing something household task
Non-Word Reading (n= 10)	46.42	43.68	50.99	43.33
Oral Reading Fluency (n=60)	24.50	23.23	25.51	24.76
Reading Comprehension (n=5)	44.73	44.34	49.50	44.22
Number Knowledge (n=5)	53.17	58.44	63.27	59.13
Currency Identification (n=3)	93.85	90.52	90.63	89.59
Summing Different Values of Currencies (n=1)	79.80	81.06	81.85	83.44

### 2.3.2 Achievement by the persons who support at home

The study demonstrates that more than two-thirds of students (76%) got support from at least one person at home. Mostly senior siblings (39% of total) are the ones who support their junior siblings at home. A few students (5.1%) also get support from their tuition teachers- the paid teachers who support students outside the school. We found an interesting result while analyzing this variable. Students who are assisted by their senior siblings and tuition teachers have achieved more in Reading whereas students who get support from their tuition-teachers achievement better in Numeracy. Figure 8 and figure 9 shows the comparative figure of students' achievement in Reading and Numeracy by the persons that support them at home.

Figure 8. Students' achievement by persons who support at home (Reading)

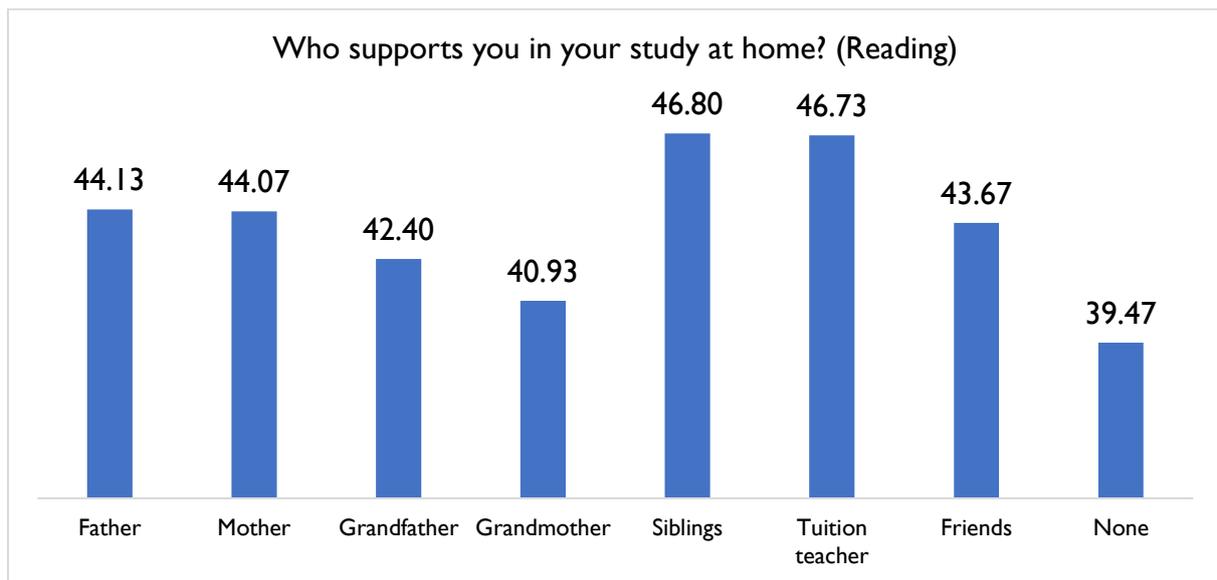


Figure 8 unfolds that students who do not have any person to support them at home have achieved the least in comparison to the children who are supported by someone at home.

Figure 9 also shows the result of Numeracy achievement which is also the same result as of Reading. In Numeracy also, students who do not have someone at home to support them achieved the least, and students who get support from tuition teacher achieved the highest. It is interesting to know that students who are supported by their grandfather also have achievement better (45.17%) than other students who got support from other members except for the tuition teacher.

Figure 9. Students' achievement by persons who support at home (Numeracy)

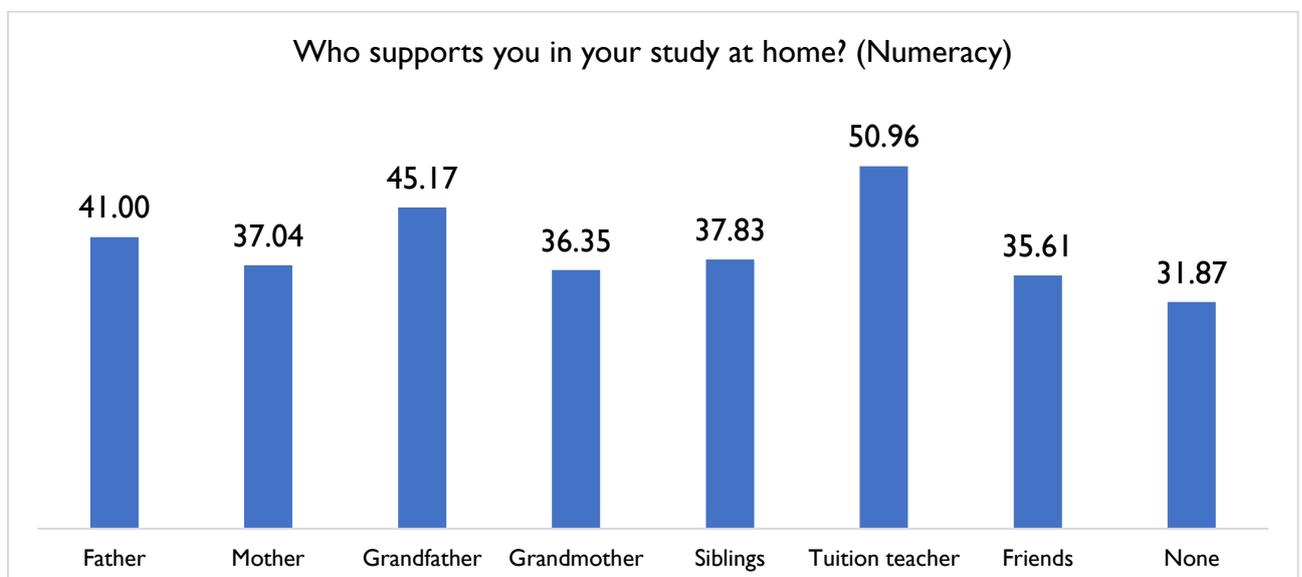


Table 12 shows the result of a one-to-one oral assessment. The table reveals many surprising facts for us. Students who get supports from their grandmother are found better in non-word reading with an average achievement of 59.49%. Similarly, the effect of tuition teacher was high in Oral Reading Fluency (29.68), Reading Comprehension (61.17%), number knowledge (75.32%) and currency identification (92.13%) and summing currencies (95.01%).

Table 12. Students' achievement by persons who support at home (Numeracy)

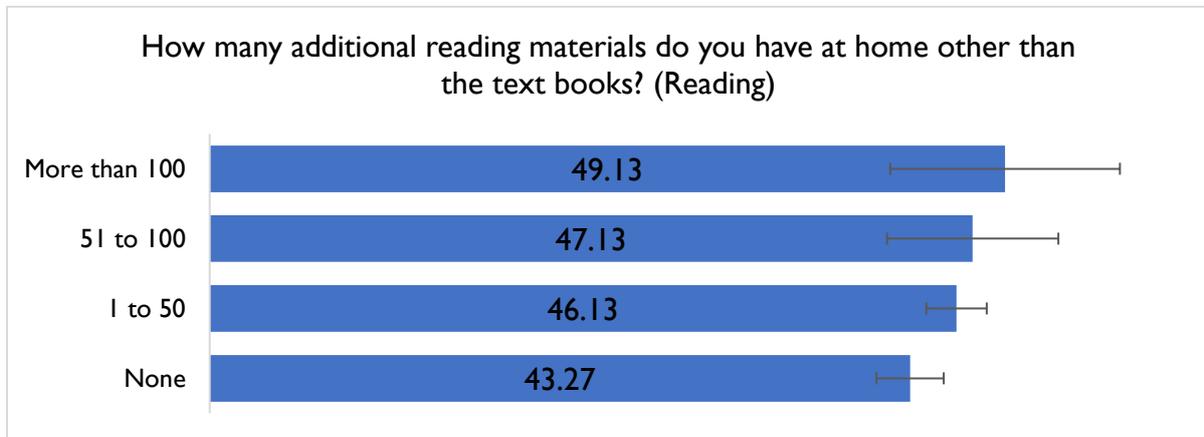
	Father	Mother	Grandfather	Grandmother	Siblings	Tuition teacher	Friends	None
Non-Word Reading (n= 10)	49.14	51.73	36.19	59.49	47.76	56.79	48.61	49.86
Oral Reading Fluency (n=60)	22.75	23.40	21.99	26.28	26.40	29.68	26.95	24.34
Reading Comprehension (n=5)	45.96	49.27	36.45	52.61	46.03	61.17	58.48	45.21
Number Knowledge (n=5)	60.64	61.09	62.29	61.99	60.53	75.32	62.67	61.30
Currency Identification (n=3)	87.50	91.60	86.89	92.50	92.13	86.10	90.17	83.43
Summing Different Values of Currencies (n=1)	82.99	79.41	59.04	82.23	79.02	95.01	89.75	83.76

Table 12 further shows that students who do not get support at home had the lowest achievement in almost all the sub-task in both Reading and Numeracy. From the same table, we have noticed that if the mother supports at home, students would have achieved better.

### 2.3.3. Availability of reading materials at home and achievement

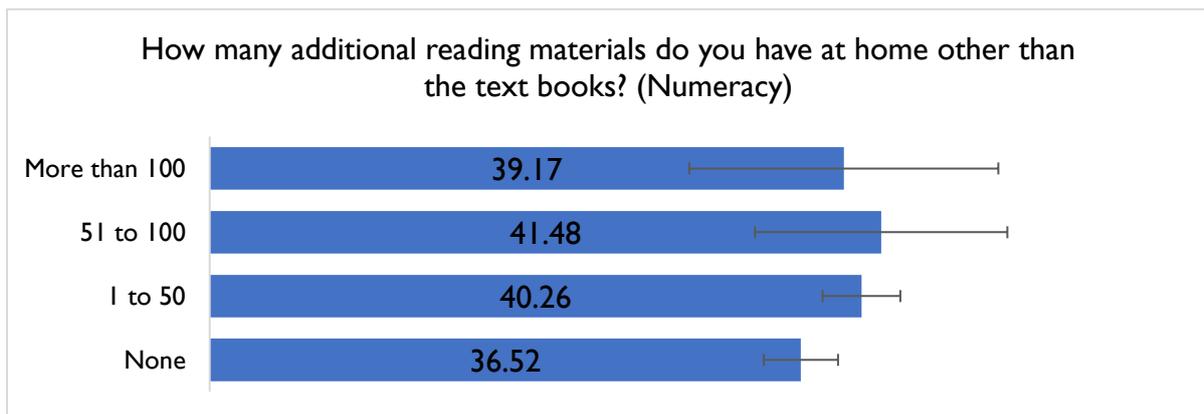
In the study, we wanted to understand how the availability of learning resources at home affects the students' achievement. For this, we found that more the learning resources better the performance of the students. Students who have more than 100 reading materials at home have achieved a 49.13% average which is about six percent point more than that of the students who do not have any learning materials. Figures 10 and 11 illustrate the achievement of students concerning the number of reading materials available at home. But the gap is not statistically significant.

Figure 10. Availability of reading materials at home and achievement (reading)



A similar result was obtained for Numeracy. Students with more number of learning materials at home have achieved better. However, the difference is not significant.

Figure 11. Availability of reading materials at home and achievement (Numeracy)



The one-to-one assessment result (table 13) also illustrates that the more the number of reading materials at home, the better the performance. Table 13 uncovers that students who have at least some materials have achieved significantly better than the students who do not have any reading materials at home.

Table 13. Availability of reading materials at home and achievement (one-to-one assessment)

	None	1 to 50	51 to 100	More than 100
Non-Word Reading (n= 10)	47.67	50.66	46.27	62.46
Oral Reading Fluency (n=60)	24.63	25.70	25.47	30.03
Reading Comprehension (n=5)	45.94	48.45	47.71	59.58
Number Knowledge (n=5)	58.57	65.36	53.99	70.24
Currency Identification (n=3)	89.41	89.13	94.36	90.91
Summing Different Values of Currencies (n=1)	80.25	83.30	78.78	84.55

### 2.3.4. Parents ask about the things that their children read at school and achievement

Students whose parents care have achievement better in both Reading and Numeracy than the students whose parents do not care about their children’s learning. Table 14 illustrates that more than ten percent point different on average in the achievement of students whose parents never ask what their children read at home versus who mostly ask in reading. The same difference for numeracy is more than five percent point.

Table 14. Parents ask about the things that students read at school and achievement

	Reading		Numeracy	
	Average	Std. Error	Average	Std. Error
Never ask	38.80	1.51	32.74	1.98
Ask sometimes	43.53	1.03	28.39	0.67
Ask mostly	48.07	1.01	37.04	1.21

Table 14 further clarifies the difference in the achievement of students between the parents who almost ask and who never ask what their children did at school is statistically significant.

The same result is noticed in the one-to-one assessment. In all the sub-tasks students have achieved better if their parents ask mostly what their children did at school. For the detail please see table 15.

Table 15. Parents ask about the things that students read at school and achievement (one-to-one assessment)

	Never ask	Ask sometimes	Ask mostly
Non-Word Reading (n= 10)	47.29	49.34	49.74
Oral Reading Fluency (n=60)	24.55	24.54	26.22
Reading Comprehension (n=5)	48.87	47.96	46.55
Number Knowledge (n=5)	57.75	60.14	64.07
Currency Identification (n=3)	92.02	88.81	89.10
Summing Different Values of Currencies (n=1)	80.62	81.38	82.04

### 2.3.5. Parents go to schools to discuss with teachers about their children’s study and achievement

Parents’ regular school visits have significantly affected the students’ achievement in both reading and numeracy. For both reading and numeracy, if students’ parents visit schools at least for sometimes a year, students have achieved better (38.87% vs. 46.27% for reading and 31.13% vs. 39.43% for numeracy). The details of the achievement are given in table 16.

Table 16. Parents go to schools to discuss with teachers about their children’s study

	Reading		Numeracy	
	Average	Std. Error	Average	Std. Error
Never ask	38.87	1.14	31.13	1.26
Asks sometimes	46.27	0.93	39.43	1.00
Asks mostly	45.73	1.45	42.00	2.19

Table 16 also clarifies that the difference in achievement is statistically significant. The findings from the table that “if parents visit schools for sometimes a year to inquire about their children’s study, students can achieve better” is generalizable to the population of the study.

A similar result was revealed from the one-to-one assessment presented in table 17. In all of the sub-task i.e. non-word reading, ORF, reading comprehension, number knowledge, currency identification, and summing the currencies there is a significant difference in the students’ achievement due to their parental frequency of schools visit. The more the school visits, the better the students’ results is the main findings of table 17.

Table 17. Parents go to schools to discuss with teachers about their children's study (one-to-one assessment)

	Never ask		Ask sometimes		Ask mostly	
	Average	Std. Error	Average	Std. Error	Average	Std. Error
Non-Word Reading (n= 10)	44.13	1.98	49.61	1.55	50.88	2.17
Oral Reading Fluency (n=60)	22.86	1.07	25.56	0.75	25.71	1.16
Reading Comprehension (n=5)	44.03	2.13	48.55	1.30	46.54	2.35
Number Knowledge (n=5)	55.24	2.08	62.80	1.25	62.97	1.94
Currency Identification (n=3)	90.88	1.69	88.94	1.35	89.82	1.84
Summing Different Values of Currencies (n=1)	78.28	2.26	82.17	1.32	82.00	2.32

## 2.4. School characteristics and Achievement

We identified that the schools' characteristics and available facilities play important role in students' achievement. Students with a better learning environment at school have achieved better than students who do not have a good environment. For the study we have explained the effect of the following school environment-related variables in students' achievement:

- a) Medium of instruction
- b) School facilities (toilet, drinking water, and sufficient classes)

### 2.4.1 Achievement by Medium of Instruction at School

From the study, we found that majority of the schools are using Nepali as the medium of instruction. In contrast with our assumption, we found a noticeable size (26%) of schools are using English as the medium of instruction. Table 18 uncovers that students from English medium schools are better than students from Nepali medium schools in both Nepali and English. The difference is statistically significant for the Reading score whereas statistical significance does not apply for the Numeracy score.

Table 18. The medium of instruction and achievement

	Reading Achievement		Numeracy Achievement	
	Average	Std. Error	Average	Std. Error
Nepali Medium Schools	42.47	0.93	36.17	1.16
English Medium Schools	49.27	1.57	40.17	1.62

The findings from Table 18 are quite contrasting with our construct that “students from Nepali medium schools are better in Reading”. It clearly indicates that students studying in public schools that use English as the medium of instruction have done significantly better in Reading than the students from Nepali medium schools.

However, the one-to-one assessment result presented in Table 19 clearly indicates there is no significant difference in non-word reading, ORF score, reading comprehension, number knowledge, identification of currency, and summing currencies sub-tasks among the students from Nepali medium schools and English medium schools.

Table 19. The medium of instruction and achievement (one-to-one assessment)

	Nepali medium schools		English medium schools	
	Average	Std. Error	Average	Std. Error
Non-Word Reading (n= 10)	49.02	1.63	49.62	2.61
Oral Reading Fluency (n=60)	24.94	0.83	27.04	1.20
Reading Comprehension (n=5)	46.87	1.48	49.55	1.76
Number Knowledge (n=5)	59.46	1.43	63.94	1.71
Currency Identification (n=3)	89.00	1.38	93.22	1.58
Summing Different Values of Currencies (n=1)	80.37	1.40	83.15	2.33

#### 2.4.2 School Facilities and Achievement

We also inquired how the school facilities including toilet, drinking water, and classroom sufficiency have affected students’ achievement in Reading and Numeracy. We found a very minimal effect of these facilities in the students’ achievement (table 20 and table 21). However, we noticed that the sufficiency of the classroom had a vital role in Reading achievement and the result is statistically significant. However, for Numeracy, the difference is not statistically significant.

Table 20. School facilities and achievement

Facility	Response	Reading		Numeracy	
		Average	Std. Error	Average	Std. Error
Toilet	No	42.20	1.92	34.17	2.37
	Yes	43.80	0.91	37.83	1.09
Drinking water	No	44.80	1.70	38.87	3.14
	Yes	43.33	0.93	36.91	1.01
Have sufficient classrooms	No	41.73	1.23	37.43	1.60
	Yes	45.27	1.09	37.09	1.26

However, in one-to-one assessment, we find a very minimal difference in achievement among the students whose schools have the facilities of toilet, drinking water, and sufficient classroom (table 21). But we found a remarkable difference in Number Knowledge due to these facilities.

Table 21. School facilities and achievement (one-to-one assessment)

	Toilet		Drinking water		Sufficient Classroom	
	No	Yes	No	Yes	No	Yes
Non-Word Reading (n=10)	46.65	49.35	50.36	48.60	48.36	49.47
Oral Reading Fluency (n=60)	22.32	25.51	24.21	25.15	24.50	25.49
Reading Comprehension (n=5)	43.65	48.44	46.13	47.96	46.78	48.39
Number Knowledge (n=5)	57.55	61.96	61.33	61.22	60.20	62.23
Currency Identification (n=3)	88.28	89.82	88.12	89.76	88.74	89.93
Summing Different Values of Currencies (n=1)	77.42	82.31	81.95	81.41	82.57	80.59

## 2.5 School leadership and achievement

We explained the role of headteachers' characteristics and in students' achievement. It is a proven fact that strengthens the leadership of the schools, better the students' achievement. This study also uncovered that headteacher with higher qualification and experience has contributed well for the better students' performance. For the study we have explained the effect of the following headteacher variables in students' achievement:

- a) Gender

- b) Education
- c) Training
- d) Experience

### 2.5.1 Headteachers' gender and students achievement

From the study, we did not find that gender of the headteacher makes any difference in students' achievement (Table 22). Students have achievement better in the schools that have female headteachers in Reading whereas in Numeracy students from male headteachers' schools have scored better. Nevertheless, the difference due to gender is not statistically significant.

Table 22. Headteachers' gender and student achievement

	Reading		Reading	
	Average	Std. Error	Average	Std. Error
Male	43.33	0.89	37.52	1.07
Female	44.07	2.05	35.09	2.29

Table 23 also showed the mixed results of students in different sub-task due to the difference in gender of the headteacher. In all of the sub-task, the remarkable difference in students' achievement is not noticed.

Table 23. Headteachers' gender and student achievement

	Achievement percent by sex	
	Male	Female
Non-Word Reading (n= 10)	49.00	44.94
Oral Reading Fluency (n=60)	24.99	25.63
Reading Comprehension (n=5)	47.72	45.83
Number Knowledge (n=5)	61.32	59.63
Currency Identification (n=3)	89.60	88.26
Summing Different Values of Currencies (n=1)	81.52	82.95

### 2.5.2 Headteachers' education and students achievement

Headteachers' education has contributed to students' achievement to some extent. Students whose headteachers' qualification was SLC or grade ten only had scored the least in both Reading and Numeracy. The difference between SLC/ grade ten qualification and master level education qualification is found statistically significant. It means students' whose headteachers' qualification is mater level or above have significantly better (44.80% in reading and 38.96% in numeracy) than the students' whose headteachers' qualification is only SLC/ grade ten (37.20% for Reading and 33.87% for numeracy). The details of the students' achievement according to headteachers' qualification is presented in table 24.

Table 24. Headteachers' qualification and student achievement

	Reading		Numeracy	
	Average	Std. Error	Average	Std. Error
SLC/ grade ten	37.20	4.77	33.87	4.53
Intermediate/ grade twelve	42.00	1.31	35.70	1.54
Bachelor level	43.13	1.87	35.87	2.30
Masters level or above	44.80	1.27	38.96	1.60

Table 25 shows the students' achievement in one-to-one assessments in different sub-tasks. Surprisingly, students have done better in Reading in the schools where the headteachers' qualification is bachelor level whereas they have done better in Numeracy if their headteachers' qualification is master level or above.

Table 25. Headteachers' qualification and student achievement (one-to-one assessment)

	SLC/ grade ten	Intermediate / grade 12	Bachelor	Master or above
Non-Word Reading (n= 10)	49.64	47.81	52.00	47.58
Oral Reading Fluency (n=60)	25.94	22.92	26.12	25.72
Reading Comprehension (n=5)	35.56	46.26	49.26	48.28
Number Knowledge (n=5)	56.75	58.48	59.21	63.77
Currency Identification (n=3)	89.02	88.55	87.32	90.79
Summing Different Values of Currencies (n=1)	78.15	80.19	79.43	83.52

### 2.5.3 Trained Headteachers and students' achievement

We were interested to know the training effect of the headteachers on students' achievement in Reading and Numeracy. The study revealed that headteachers' training has a positive and significant effect on students' achievement. Table 26 indicates that if the headteachers have taken training in the last two years, students have achieved better (46.20% against 42.20% in Reading and 39.78% against 35.91% in Numeracy).

Table 26. Headteachers' training and student achievement

Did you get any training in the last two years?	Reading		Reading	
	Average	Std. Error	Average	Std. Error
No	42.20	0.98	35.91	1.23
Yes	46.13	1.48	39.78	1.73

Table 27 also shows a similar result as of table 26. For most of the sub-task, students whose headteachers got trained in the last two years to have achieved better than the students whose headteacher did not get the training in the last two years. The

difference in ORF (23.85 versus 27.39) and Reading Comprehension (45.57% versus 51.51%) are quite remarkable and statistically significant as well.

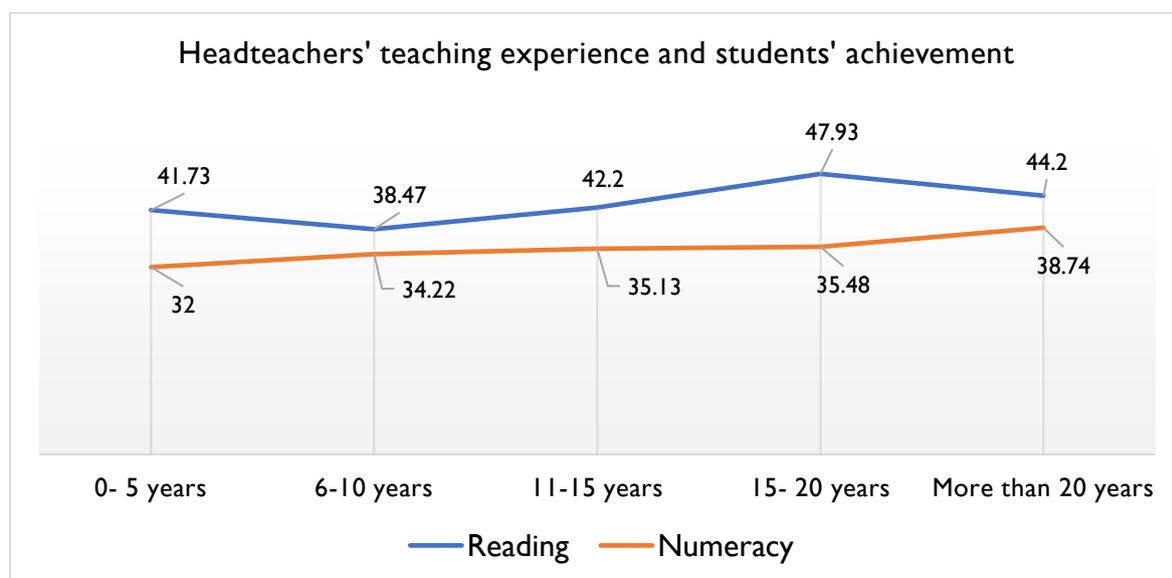
Table 27. Headteachers' training and student achievement (one-to-one assessment)

	Did you get training in the last two years?	
	No	Yes
Non-Word Reading (n= 10)	48.39	50.03
Oral Reading Fluency (n=60)	23.85	27.39
Reading Comprehension (n=5)	45.57	51.51
Number Knowledge (n=5)	59.01	65.71
Currency Identification (n=3)	89.85	88.12
Summing Different Values of Currencies (n=1)	81.12	82.10

### 2.5.4 Headteachers teaching experience and students' achievement

The study also revealed that headteachers' teaching experience also played a vital role in the students' achievement. Up to 15 years of experience, the students' achievement increases as an increase in years of experience. But after 15 years of experience, the experience did not make any difference. In the Reading case, achievement was found declining. The details of the achievement concerning years of experience of the headteachers are presented in figure 12.

Figure 12. Headteachers teaching experience and students' achievement



The oral one-to-one test also showed the same result as in figure 12. In the oral tests too, the years of teaching experience of the headteachers have significantly contributed to students' scores in both Reading and Numeracy. But the long experience i.e. (more than 20 years) made a negative effect on students' achievement.

Table 28. Headteachers teaching experience and students' achievement (one-to-one assessment)

	Teaching Experience				
	0 to 5 years	6 to 10 years	11 to 15 years	16 to 20 years	More than 20 years
Non-Word Reading (n= 10)	53.77	46.90	49.87	54.01	47.91
Oral Reading Fluency (n=60)	23.48	23.07	26.09	27.21	25.10
Reading Comprehension (n=5)	45.69	44.70	45.20	47.30	48.87
Number Knowledge (n=5)	56.87	61.29	57.69	62.16	62.35
Currency Identification (n=3)	89.38	85.93	80.54	79.57	92.65
Summing Different Values of Currencies (n=1)	79.85	82.74	75.29	78.51	82.92

## 2.6 Categorization of Readers

The study also reports the status of different categories of readers. MoEST has already defined the reading benchmark which includes the cwpm and comprehension. According to MoEST (2018), the reading benchmark is 45 words per minute with 80% comprehension. It is, however, would be useful to categorize the readers into three different categories based upon the available data including CB-EGRA data from 2016 to 2020 and USAID's Early Grade Reading Program's baseline, midline, and endline data. For the reporting purpose, the study defines four categories of readers

- a) No reader: The student who could not read a single word correctly in one minute
- b) Initial reader: The readers who can read up to 1-15 words correctly in one minute
- c) Emergent readers: The readers who can read 16 to 44 words correctly in one minute
- d) Fluent readers: The readers who can read more than 45 words correctly in one minute

The one-to-one oral assessment is used to analyze these categories.

### 2. 6.1 Percent of students meeting grade-level reading proficiency

The study showed that 8.41% of students could meet the grade-level reading proficiency as defined by MoEST (2018). It means the students could read 45 or more words correctly in one minute and comprehend 80% or more questions related to the text of 60 words.

Table 29. Percent of students meeting grade-level reading proficiency

	Est. Population	Student percent	Std. Error
No. of students who do not meet minimum reading proficiency	321680	91.59%	0.83%
No. of students who met minimum reading proficiency	29553	8.41%	0.83%
Total	351233	100.00%	0.00%

## 2. 6.2 Readers categorization

The NARN study shows that there is still more than 10 percent of students in grade three who cannot read a single word correctly. Table 30 gives details of the percentage of different categories of readers. 27.60% of grade three children can read up to 15 words correctly whereas 43.30% of students can read up to 45 words correctly. Out of the total, 18.90% of students' are found, fluent readers. It is clear that more than half of the fluent readers also cannot make 80% comprehension. It is an alarming finding.

Table 30. Different levels of readers

Readers	Est. Population	Percent of learners	Std. Error	95% Confidence Interval	
				Lower	Upper
No readers (ORF = 0)	36001	10.20%	0.90%	8.60%	12.10%
Initial readers (ORF: 1 to 15)	96902	27.60%	1.30%	25.10%	30.20%
Emergent readers (ORF: 16- 44)	152117	43.30%	1.30%	40.80%	45.90%
Fluent readers (ORF: 45 or above)	66212	18.90%	1.30%	16.50%	21.40%
Total	351232	100.00%	0.00%	100.00%	100.00%

## Chapter III: Summary, Conclusion, and Recommendation

The NARN study reveals many things that had not been highlighted in the past. The group assessment and one-to-one assessment were conducted to understand students' achievement status in Reading and Numeracy. Mainly, students' background variables, schools related factors, parental supports, and headteacher related variables were analyzed to understand the dimensions that affect students' achieving in Reading and Numeracy. In the end, students reading data was further analyzed to understand the percent of students who meet grade-level proficiency.

Since the tools and items of both areas were different with different ability level questions. So, in general, results obtained for Reading and Numeracy are not comparable. However, the result showed that the average achievement percent in reading is 43.53 and that in Numeracy is 37.22%. The average non-word reading ability was 48.99% and that of ORF was 25.04. It means students' are lying to emergent readers on average. Students were able to comprehend less than half of the questions (47.68%). However, students did well in Numeracy oral assessment. The average Number of Knowledge per student was 61.30% and each student was able to solve more than 80% of problems related to currency counting and summing the currencies. By looking at the different sub-tasks, students were found lagging in the dictation sub-task in Reading and the use of arithmetic signs in Numeracy. Similarly, clock reading was another hard part for the students.

Socio-demographic characters of students had a mixed effect on students' achievement. Students from Gandaki Province were found best in Reading whereas students from Province 2 were best in Numeracy. The sex of students did not make much difference in students' performance. However, boys were found significantly better at reading than girls. It was quite surprising to know that students above eight years of achievement significantly better in both Reading and Numeracy.

Home language always becomes a prevailing factor in language achievement. The same result was revealed in the study. Students with L1 home language achieved significantly better than L2 students' in reading. But the difference for the Numeracy was not statistically significant.

The study unfolded that students' performance is directly related to how they utilize their time at home. Students who play mobile phones and tables achieved significantly lower than students doing anything other than this at home. Doing homework or reading at home was found quite supportive for students to achieve better in both Reading and Numeracy.

Students who got support at home also performed significantly better than the students who did not get support from anyone at home. Tuition teacher support and support from senior siblings were found effective for the children's performance in both reading and numeracy.

Students who had at least some materials at home to read have done significantly better than the students who did not have any reading materials at home. However, the number of materials did not make a significant effect on the performance of children.

Parental care was found one of the important factors for the students' achievement. If parents asked children about their reading or they visited school frequently to discuss children's progress, students had performed better in these cases. However, students whose parents never visited schools to discuss with teachers or never asked them about the study at home had performed significantly lower.

Among many school-related attributes, only the medium of instruction was found strongly contributing to students' achievement. Students who studied in English medium schools had done significantly better in Reading than the students from Nepali medium school. It was quite surprising that more than one-fourth of the public schools were running using English as the medium of instruction. Toilet and drinking water facilities at schools were not found that prevailing factors for the students' achievement. Nevertheless, the sufficiency of the classroom in the schools had a significant effect on Reading ability but it was indifferent to Numeracy ability.

School headteachers' gender did not play a remarkable role in students' achievement. However, education had a significant effect on students' performance. The higher the degree of the headteachers, the better the students' scores in both Reading and Numeracy was noticed. Moreover, headteachers' training had a strong relationship with the students' performance. If the headteachers were trained in the last two years, students' performance was significantly better. Headteacher years of teaching experience had a mixed effect. The long experience was supportive (up to 20 years of experience), but the very long (more than 20 years) experience of the headteachers impacted negatively the students' performance.

At last, the study further analyzed the reading data. The study showed that 8.41% of students had met the grade level proficiency in reading with 45 cwpm and 80% comprehension. Similarly, the study revealed an alarming situation that 10.20% of grade three children could not read a single word correctly in one minute.

Based on the above summary and conclusion the following are the recommendation for further improvement:

- a) Students from Gandaki province were better in Reading and that from Province 2 were better in Numeracy. A difference should be conducted in these regions to understand the factors that supported students' skills. The findings should be utilized for the overall growth of students from all over the country.
- b) Parental support was found one of the prevailing factors to enhance students' Reading and Numeracy ability. MoEST can work with local government to enhance parental engagement in children's learning.

- c) Students from English medium schools had achievement better in Reading. The factors that helped students to achieve better should be studied and good practices should be implemented all over the country. To minimize the debate of English medium versus Nepali medium should be solved by conducting dedicated research on the medium of instruction and students' performance.
- d) Schools with sufficient classrooms had done better in Reading. So, it is clear that minimum physical infrastructure is associated with students' performance. So, the minimum physical infrastructure in the schools should be ensured.
- e) Headteachers' training played a vital role in students' performance. So, headteachers should be trained and refreshed in modern leadership techniques periodically.
- f) More than 10% of children in grade three could not read a single word correctly. So, reading focused programs should be designed and implemented in early grades.