Analysis of the learning environment in basic education schools in the Republic of the Union of Myanmar

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Abstract

The current status of the learning environment of basic education schools in Myanmar was clarified by analyzing the data for the 2019 academic year, and the issues to be improved were pointed out.

Schools with some form of library function were greater than 80% on a national average, and the rate increased when the size of the school increased. There were concerns about a shortage of classrooms due to an increase in the number of students, but in some cases, the use of school buildings was being promoted through a two-shift system. There were basic problems such as a lack of electricity. Although water supply, toilet facilities, and other water-related environments of basic education schools were relatively well developed nationwide, there were still delays in the development in some areas and types of schools.

In addition to the physical learning environment, it is also necessary to improve the teaching capacities of teachers. Some schools had no teachers who received training mainly in small-scale schools. Although school attendance of students with disabilities is also seen in many schools, it appears that many students with disabilities remain in school for only a short period of time.

1. Purpose

Providing an appropriate learning environment in schools is important both in promoting enrollment and in improving academic attainment. The basic learning environment of schools under the Department of Basic Education, Ministry of Education of the Republic of the Union of Myanmar was analyzed by Muta [1] based on the data for 2017 academic year. In this report, the recent situation in the learning environment in basic education schools was analyzed using the latest data, including not only the hardware, but also the results of teacher training, focusing on information that was lacking in previous analyses. In addition, since the enhancement of inclusive education is required in response to the "No one left behind" policy, the actual situation in education for students with disabilities, including facilities, was clarified.

2. Methods

Individual school dataset collected in the autumn of 2019 under the Department of Basic Education, Ministry of Education was used. The dataset contains 47,440 schools of high schools, branch high schools, middle schools, branch middle schools, post primary schools, primary schools, branch primary schools, and affiliate primary schools as shown in Table 1. According to the Ministry of Education's statistics as of the end of the 2019 academic year, the total number of basic education schools under the Department of Basic Education, Ministry of Education was 47,445, so as of the autumn of 2019, all basic education schools were considered to be included in the dataset.

However, the schools included in this dataset included schools with no students from the preschool[1]

[1] Early childhood class in basic education schools for 3-4 years old children before entering Kindergarten (KG).

Table 1. Number of Schools by School Category Used in Data

School category	Registered	No students	Number of schools used		
			Rural	Urban	Total
High	2,852	4	1,825	1,023	2,848
High Branch	2,794	4	2,535	255	2,790
Middle	3,729	3	3,375	351	3,726
Middle Branch	3,982	11	3,599	372	3,971
Post Primary	7,794	61	6,816	917	7,733
Primary	24,103	244	20,664	3,195	23,859
Primary Branch	2,165	132	1,906	127	2,033
Primary Affiliate	21	19	1	1	2
Total	47,440	478	40,721	6,241	46,962

(PS) class to the 11th grade (G11). These were schools that were registered, but have since closed, schools in conflict zones that were temporarily closed, or schools for which data was not available for various reasons. These schools with no students were not included in the following analysis, even if other information was available, because they were not only meaningless in considering the current status of the learning environment for students, but they were also an obstacle when looking at the relationship between variables. Therefore, as shown in Table 1, the total number of schools used in the analysis was 46,962.

3. Analysis Results

3.1 Library

3.1.1 Overall Composition

The library is important for helping students learn, and the Ministry of Education has made various efforts to improve the library function. Policy documents such as NESP2: 2021-2030 [2], which were available at the time of this writing, included plans to improve the library. However, there have been few concrete clues as to what the current situation is.

The 2019 individual school dataset provided information related to the library, including the existence of a library, its size (area), the number of cupboards and bookshelves on which books were placed, and the number of books stored at each school. However, care must be taken in reading this data. First, if there was no description, it was impossible to distinguish whether data was simply not taken, or it was 0. Since the size of cupboards and bookshelves was not described, it was unnecessary to analyze them separately, and they were added together for further consideration. First, the four types of data were categorized as 0 (no) when they are 0 or no description, and 1 (yes) when they were stated and were non-zero. The results of the cross tabulation for the four variables are shown in Table 2.

Assuming that all the values here were correct and there were no misrepresentations, we can understand the following. There were 7,563 schools, or only 16.10% of the total, which had libraries and the number of cupboards/bookshelves, the number of books, and the area of the libraries was known. There were many schools that gave no area; and the value was considered to be 0. However, if the area was ignored, 65.62% of schools had libraries, and the numbers of cupboards/bookshelves and books were known. However, it is clear that 12.00% or 5,634 schools had no library and no cupboard/bookshelf or even a book. However, there was a variety of other schools, each which can be interpreted as follows.

- Although there were libraries, schools that did not have cupboards/bookshelves or books used the libraries for other purposes such as classrooms.
- Although there were no libraries, cupboards/bookshelves and books were located in a corner of the corridor or other place for use.
- Schools that had books without cupboards/bookshelves stacked the books flat on the desks.
- Some schools did not have books even though they had cupboards/bookshelves.
- Schools that did not have libraries but list values for a library area were thought to have a corner consisting of cupboards/bookshelves and books in the corridor or teacher's room, for example, although it was not a library in the true sense of the word.

Table 2. Cross Tabulation Analysis of Four Variables Related to Library

Library	Book	Book Shelf +Cup Board 0			Book Shelf +Cup Board 1			Shelf Total
		Book 0	Book 1	Book Total	Book 0	Book 1	Book Total	Book Total
Library 0	Area 0	5,634	700	6,334	475	2,248	2,723	9,057
	Area 1	4	13	17	10	108	118	135
	Area Total	5,638	713	6,351	485	2,356	2,841	9,192
Library 1	Area 0	832	4,762	5,594	687	23,252	23,939	29,533
	Area 1	164	378	542	132	7,563	7,695	8,237
	Area Total	996	5,140	6,136	819	30,815	31,634	37,770
Library Total	Area Total	6,634	5,853	12,487	1,304	33,171	34,475	46,962

3.1.2 Proportion of Each Variable

As described above, in order to see the current status of information related to a library at each school, it was necessary to devise an analysis procedure. First, the presence of each of the four variables was analyzed further. Table 3 shows the percentage of library-related variables that were present (not zero) by school category. As a whole, the percentage of books was the highest at 83.10%, followed by the libraries, then the cupboards/ bookshelves with the lowest percentage of library area.

The reason why the area of the library was the smallest could be simply because the calculations were cumbersome and many of the entries were unfilled. However, 72.92% of schools that said they had a library in the high school also responded that they had a positive value for the library area for example. However, in the case of primary schools, this ratio was 11.92%. It may be that a library existed, but it was too troublesome to fill in the size of the library; and the situation must have been the same for all school categories. In fact, it may have been easier to fill in this data for a primary school than for a high school because of the smaller area. Therefore, it was correct to assume that the schools that responded they had a library, were actually saying they had space (including teacher's room, corridor, etc.) which functioned as a library. Therefore, the specific size of the library could not be given. For each variable, the higher the school category ranking, the larger the value. Four variables were often zero at schools below the primary school level.

Table 3 includes the results of the analysis of the library area based on data for the 2017 academic year. It is clear that the values have improved over the past two years, but they were also very similar. The fact that the value for the library area in the 2019 academic year was zero

Table 3. Percentage of Library-related Variables with (Yes) by School Category

School category	Ratio of existence/described				Number of schools	Reference
	Library	Library Area	Book shelf & Cup board	Book		Library Area *(2017)
High	0.9505	0.6931	0.9652	0.9480	2,848	0.6608
High Branch	0.9172	0.4269	0.9025	0.9179	2,790	0.4834
Middle	0.8677	0.3140	0.8368	0.8830	3,726	0.3077
Middle Branch	0.8245	0.1909	0.7892	0.8585	3,971	0.1835
Post Primary	0.7635	0.1223	0.7362	0.8243	7,733	0.1037
Primary	0.8020	0.0956	0.6978	0.8245	23,859	0.0809
Primary Branch	0.4712	0.0251	0.3015	0.5007	2,033	0.0250
Primary Affiliate	0.5000	0.0000	0.5000	0.0000	2	0.0000
Total	0.8043	0.1783	0.7341	0.8310	46,962	0.1473

Note: *The values of Muta [1], Table 2 were recalculated based on the new criteria.

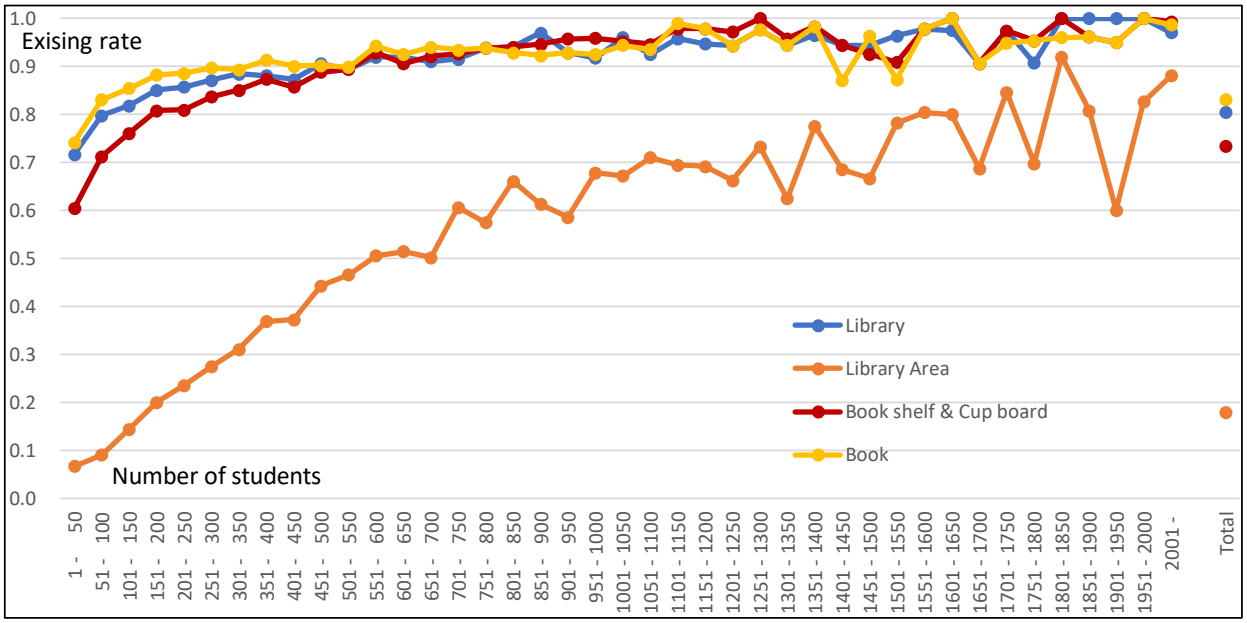

Figure 1. Percentage of Library-related Variables (Yes) by School Size

was not a missing data, but rather there were no values to be described. In other words, this value indicated the existence of a "so-called library." Therefore, the presence or absence of a library in this dataset was interpreted as an answer in reality to the presence or the absence of a “library function.”

Figure 1 shows the same values for the four variables by school size (number of students from PS to G11), and the average values are shown. As the size of schools increased, the number of schools decreased, so there was a tendency for the variation in the mean values to increase. However, there was a good correlation between the size of schools and the four variables. The percentage for the existence of libraries, cupboards/bookshelves, and books exceeded 90% when the number of students exceeded 500. On the other hand, in schools with 500 students, it was believed that half of the schools were able to afford physical space for a library.

Table 4. Magnitude of Library-Related Variables by School Category

School category	Library Area Square feet	Book shelfs & Cup boards Number	Books Number
High	755.42	5.56	1,220.34
High Branch	562.79	2.83	418.34
Middle	484.71	2.54	270.81
Middle Branch	389.66	2.25	184.23
Post Primary	361.32	2.02	147.98
Primary	343.34	1.79	107.48
Primary Branch	282.02	1.86	45.50
Primary Affiliate		2.00	
Total	497.33	2.32	230.35

Note: Only schools which show positive figures were used for calculation.

3.1.3 Magnitude of Each Variable

Table 4 shows the mean magnitude of the library-related variables by school category. For each variable, schools with a value of 0 were excluded from the calculation. There were major differences in the library area, from 282.02ft2 in branch primary schools to 755.42 ft2 in high schools. Similarly, the number of cupboards/bookshelves rose from 1.86 to 5.56, and the number of books grew from 45.50 to 1,220.34.

Figure 2 shows the area of the library by school size. The average area for all schools was 497.33 ft2, but as the size of the schools increased, the area of the library also increased, which was 915.45 ft2 for more than 2,000 students. Incidentally, in Myanmar,

24×30 = 720 ft² was the typical size of one class (Muta, 2018b), not including the corridor portion.

Figure 3 shows the number of cupboards/ bookshelves by school size. The average number of all schools was 2.32, but the number of cupboards/bookshelves increased as the size of schools increased; and for schools with more than 2,000 students, the number of cupboards/ bookshelves was 9.98. Figure 4 shows the number of books collected by school size. The average number for all schools was 230.35 books, but as school size increased, the number of books also increased. The average number of books was 2,452.36 for more than 2,000 students.

3.1.4 Regional Variation

The four main variables that represent the library function have been the source of debate, but according to Figure 1, there was no significant difference in the distribution of the other three variables, excluding the library area. Given the actual conditions of students'

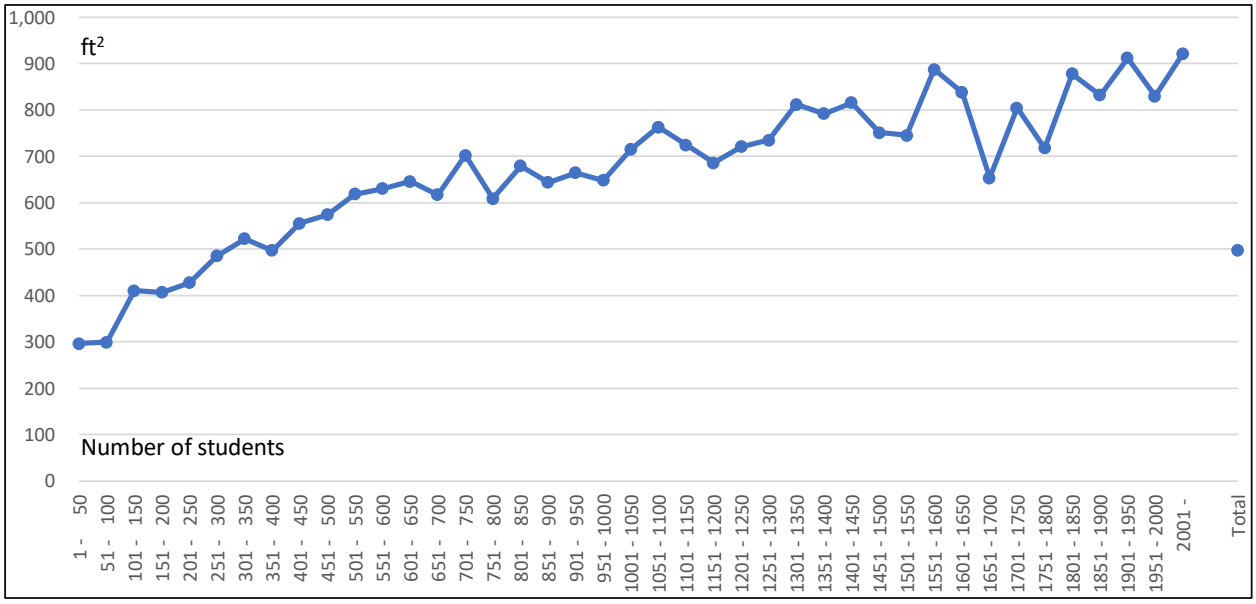

Figure 2. Area of Library Area by School Size

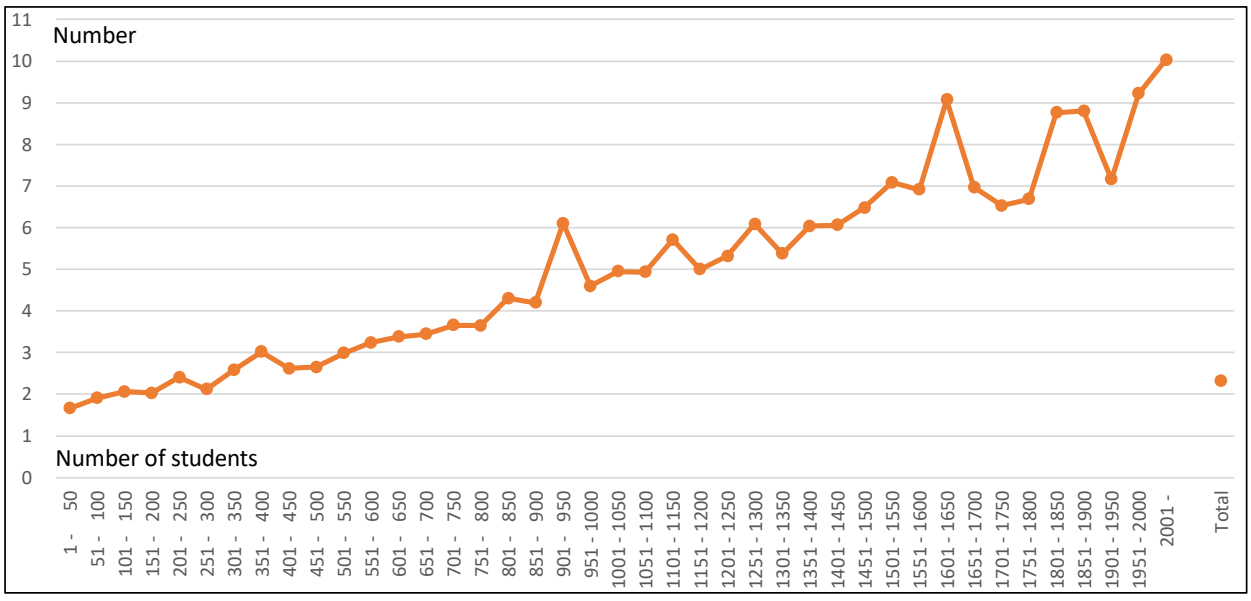

Figure 3. Number of Cupboards/bookshelves by School Size

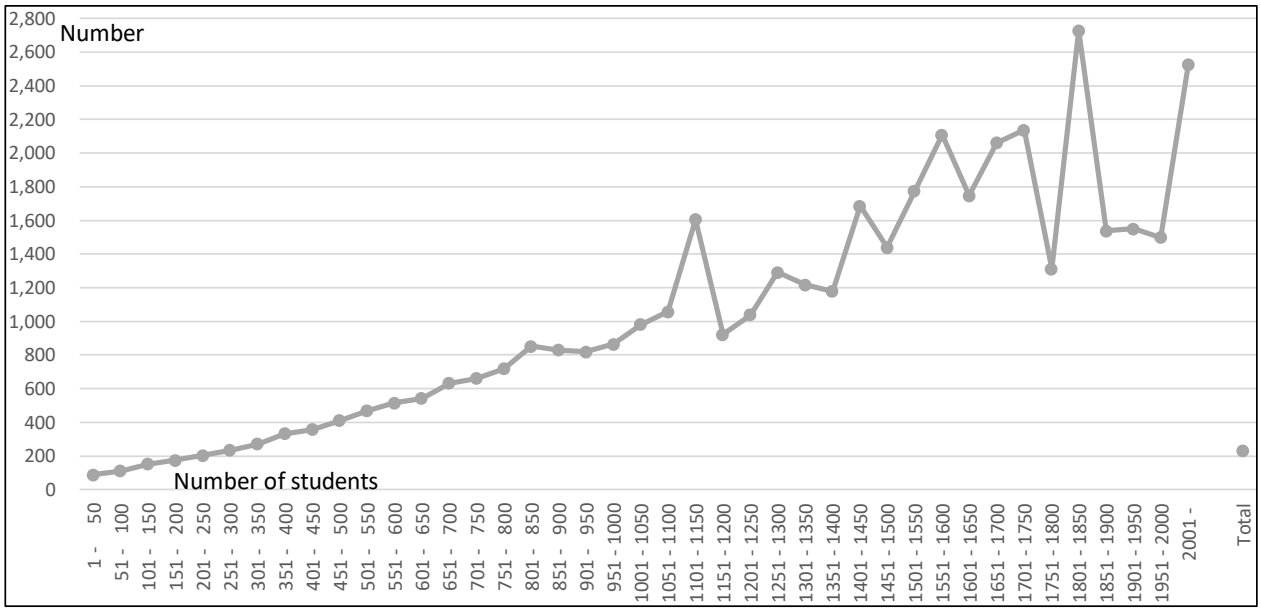

Figure 4. Number of Books Collected by School Size

use of books and ease of measurement, the variables concerning the existence of cupboards/bookshelves appeared to be easy to use. Figure 5 shows how the number of cupboards/ bookshelves varied depending on the region, and according to the States/Regions. According to Figure 1, the number of cupboards/bookshelves depended largely on school size. Therefore, since the difference in school size among regions was reflected in the differences between the States/Regions, this difference in size was also adjusted (the distribution of school size in each State/Region was adjusted to be the same as the national average).

This adjusted value was seen to be the value that

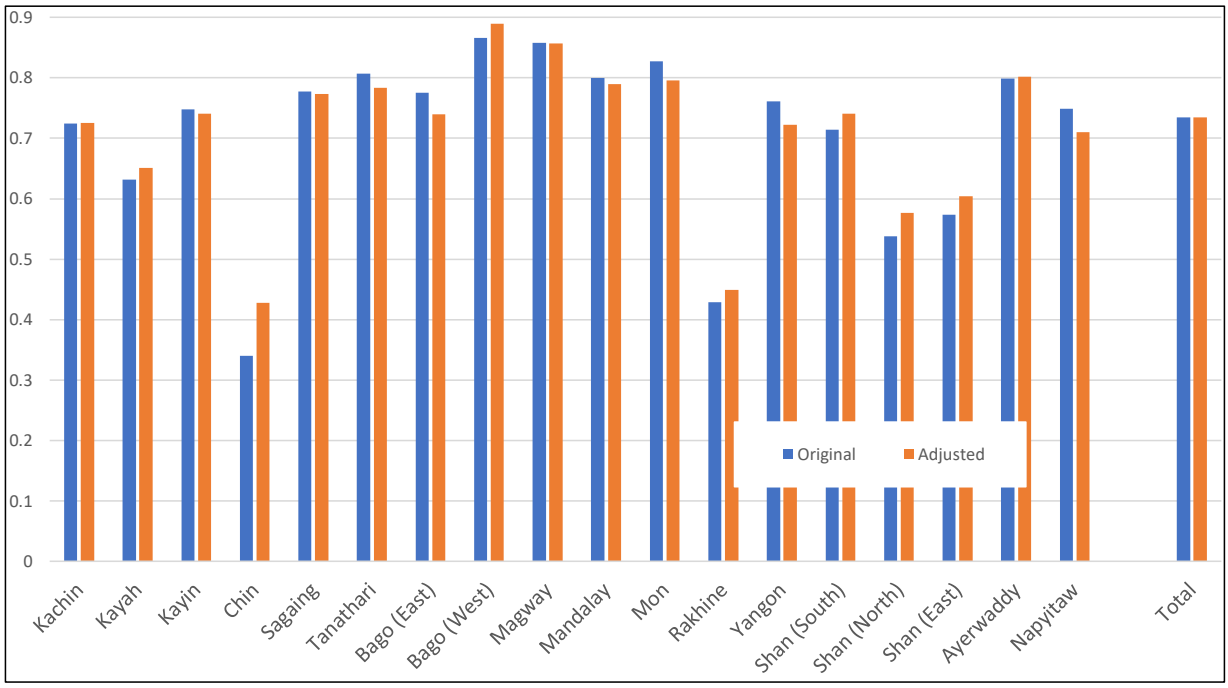

Figure 5. Possession Rate of Cupboards/bookshelves by State/Region

showed the extent of the library function in each State/Region, excluding the effect of school size distribution. However, as was apparent from Figure 5, the adjusted school size did not significantly change the results. The original value and the adjusted value were also large in Bago (West) and Magway, and the value was small in Chin and Rakhine. The largest value was twice as large compared to the smallest value, which indicated that the library function in some regions was quite poor. The improvement of the library function is expected to contribute to the improvement of students' linguistic abilities and the development of their imagination. Rectification of regional disparities is also emphasized in NESP2, and improving the library function in those inadequate areas by providing special allowances is urgently needed. Even if it is not possible to secure a room for a library immediately due to space constraints, it should be possible to set up a book corner and provide cupboards/bookshelves and books.

3.2 Two-shift System and the Area of the School Building

There was no data on the extent to which the schools were adopting the two-shift system, and in Muta [1], the national average of the two-shift system was estimated to be 6.94% based on the standard school building area required per student. However, the 2019 data included information on the presence or absence of a two-shift system for each school. According to this data as shown in Table 5, only 1.89% of all schools were two-shift schools. According to school category, the percentage was the highest at 8.50% in high schools. Since Muta [1] estimated two-shift schools based on the school building area required per student, the values in Table 5 signified that there may be many overcrowded schools where the school building area per student was significantly smaller than the standard value.

For rural or urban areas, the two-shift system was more common in urban areas. This result was seen as based on the number of students, because the primary reason for creating a two-shift system was the shortage of school building area relative to the number of students. Therefore, a good correlation was seen in Figure 6 when looking at the relationship between the number of students and the two-shift system. About 10% of schools with 900 students and more than 30% of schools with more than 2,000 students adopted a two-shift system. Incidentally, the largest school had 4,497 students under a one-shift system and 7,052 students under a two-shift system.

In Muta [1], the school building area was regressed on the number of students; and it was estimated that an area of 18.19 ft2 per student was used. This was close to the theoretical 20 ft2. The data on the area of buildings for the 2019 academic year were presented by the number of typical sizes (30ft×60 ft, 30ft×90 ft, etc.) and the number of irregular sizes of school buildings.

Table 5. Ratio of Schools under the Two-shift System by School Category

	Number of Two shift schools			Ratio of Two shift schools		
School category	Rural	Urban	Total	Rural	Urban	Total
High	67	175	242	0.0367	0.1711	0.0850
High Branch	80	28	108	0.0316	0.1098	0.0387
Middle	44	34	78	0.0130	0.0969	0.0209
Middle Branch	58	18	76	0.0161	0.0484	0.0191
Post Primary	89	26	115	0.0131	0.0284	0.0149
Primary	176	56	232	0.0085	0.0175	0.0097
Primary Branch	32	4	36	0.0168	0.0315	0.0177
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	546	341	887	0.0134	0.0546	0.0189

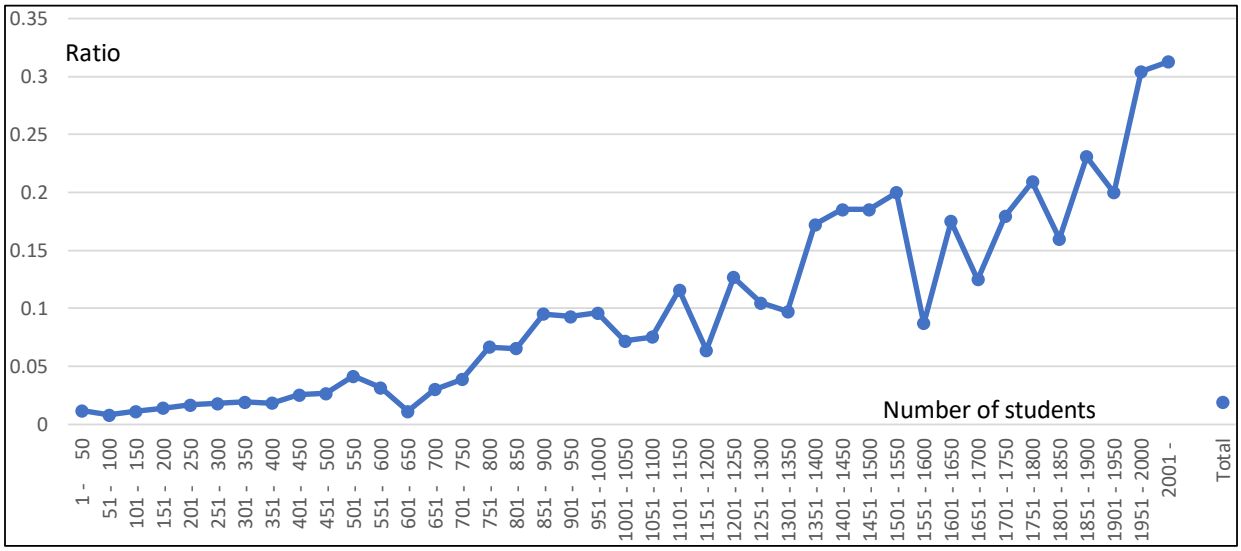

Figure 6. Ratio of Schools under the Two-shift System by School Size

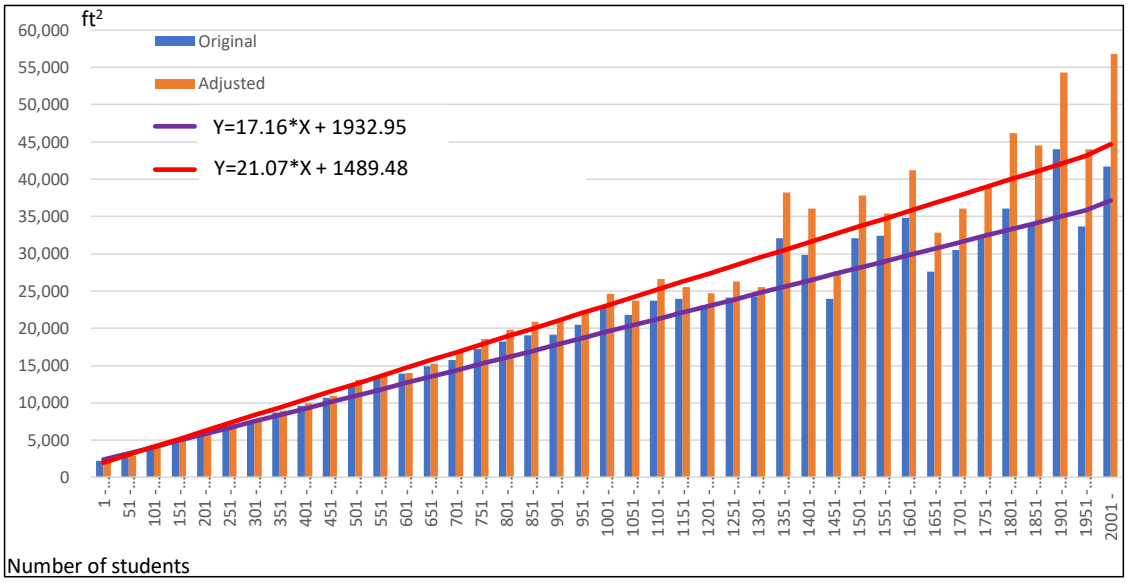

Figure 7. Area of School Buildings by School Size

Although the area of a typical size school building was easily calculated, there was a problem calculating the area of irregular size school buildings, even if the number was known. Therefore, in this paper, the following calculations were conducted only for schools that consisted of typical size school buildings. Of course, the number of samples was reduced, but since 31,341 schools were still available, the sample size was seen as sufficient to explore the whole of Myanmar.

Figure 7 shows the results for the average area school building according to the number of students. The size of school buildings was then regressed based on the number of students. Initially, the actual values were kept, and next, the two-shift school was adjusted by doubling its school building area. Figure 7 also shows the results of regression according to the number of students. The regression equations were as follows;

Current value

School building area (ft2) = 17.16 × number of students + 1,932.95 (adj. R2=0.6724)

Value obtained by adjusting the two-shift system

School building area (ft2) = 21.07 × number of students + 1,489.48 (adj. R2=0.6824).

Assuming that all schools adopted the one-shift system, there was only 17.16 ft2 per student, but it was 21.07 ft2 if the two-shift system was considered. It was adequate. As can be seen from Figure 7, the fitness appeared good when the number of students was up to 1,000. The two-shift system was not necessarily a favorable policy in terms of learning effectiveness, as it may shorten the learning time at school. On the other hand, based on the current situation where school buildings have limited space, the introduction of the two-shift system would avoid overcrowded classrooms and ensured sufficient space for each student, thereby enhancing the learning effect. Further research is needed to determine the merits and demerits of this system.

The quality of the school building is just as important as its area. The building has a useful life and maintenance is essential. Table 6 shows the existence of a dangerous school building. Calculations for schools with valid data showed that 11.38% of schools had dangerous buildings. The reason why the percentage of dangerous buildings was higher in urban areas than in rural areas was due to the older construction year. Likewise, the high percentage of dangerous buildings in upper-ranking schools such as high schools can also be attributed to the presence of many old school buildings. For these reasons, 32.97% of the high schools in urban area had dangerous buildings.

Of course, dangerous school buildings were only a part of all the school buildings. Table 7 shows the percentage for the area of dangerous school buildings at each school using the valid sample used in the calculation in Table 7. As the number of samples used

Table 6. Percentage of Schools with Dangerous Buildings by School Category

	Rural		Urban		Total	
School category	Ratio	Total	Ratio	Total	Ratio	Total
High	0.2593	1,801	0.3297	1,010	0.2846	2,811
High Branch	0.1917	2,452	0.2341	252	0.1956	2,704
Middle	0.1797	3,278	0.2035	344	0.1819	3,622
Middle Branch	0.1255	3,435	0.1488	363	0.1277	3,798
Post Primary	0.1080	6,472	0.1321	893	0.1109	7,365
Primary	0.0743	19,561	0.0804	3,097	0.0752	22,658
Primary Branch	0.0571	1,700	0.0444	90	0.0564	1,790
Primary Affiliate	0.0000	1	0.0000	1	0.0000	2
Total	0.1087	38,700	0.1466	6,050	0.1138	44,750

Note: Only schools with valid data were counted for calculation

Table 7. Area of Dangerous School Building by School Category

	% of damaged area of school buildings						Sch. for
School category	0%	0.1～20	20.1～40	40.1～60	60.1～80	80.1～100	calcu.
High	0.7564	0.1003	0.0905	0.0284	0.0122	0.0122	1,724
High Branch	0.8308	0.0360	0.0686	0.0355	0.0087	0.0203	1,720
Middle	0.8443	0.0133	0.0610	0.0386	0.0125	0.0303	2,409
Middle Branch	0.8906	0.0035	0.0354	0.0295	0.0083	0.0327	2,540
Post Primary	0.9044	0.0012	0.0167	0.0252	0.0076	0.0449	4,970
Primary	0.9395	0.0005	0.0035	0.0084	0.0029	0.0452	16,851
Primary Branch	0.9564	0.0000	0.0000	0.0009	0.0000	0.0427	1,125
Primary Affiliate	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2
Total	0.9072	0.0093	0.0208	0.0174	0.0056	0.0397	31,341

was different from the total as shown in Table 6, the proportion of schools with no dangerous buildings was somewhat higher in Table 7. In 3.97% of the schools, more than 80% of the building area was at risk, and this percentage was smaller for upper-ranking schools such as high schools. This was because there were multiple school buildings that were not old and dangerous. The fact that 10.03% of high schools had some, but less than 20% of dangerous buildings showed that old and dangerous buildings existed. Although the percentage of dangerous school buildings in lower-ranking schools was smaller on average, all of them may be dangerous because there were only a few school buildings. The shortage of classrooms became apparent due to the reforms of the current education system. It is conceivable to temporarily put the school on a two-shift system to allow time for expansion, but the number of school buildings that have reached the end of their useful life continues to increase every year. Reconstructing dangerous school buildings is urgently required, and a systematic reconstruction plan is necessary.

3.3 Laboratory

The laboratory is indispensable for high quality science education. As shown in Table 8, the total number of schools with laboratories was 3.23%, but in the case of high schools, the figure was 45.44%. However, it was as high as 73.70% especially in urban areas. In contrast, it was a low 29.59% in rural areas, and the disparity was large. In addition, branch high schools accounted for only 4.91%, and the difference with high schools was large.

However, even if a room called a laboratory existed, it would be pointless if it did not have the necessary facilities and equipment. Table 9 shows the number of

Table 8. Ratio of Schools with Laboratories by School Category

	Schools with laboratory			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	540	754	1,294	0.2959	0.7370	0.4544
High Branch	99	38	137	0.0391	0.1490	0.0491
Middle	11	47	58	0.0033	0.1339	0.0156
Middle Branch	5	1	6	0.0014	0.0027	0.0015
Post Primary	3	0	3	0.0004	0.0000	0.0004
Primary	16	2	18	0.0008	0.0006	0.0008
Primary Branch	1	0	1	0.0005	0.0000	0.0005
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	675	842	1,517	0.0166	0.1349	0.0323

Table 9. Percentage of Schools with Full Laboratories by School Category

	Schools with computer room			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	176	308	484	0.0964	0.3011	0.1699
High Branch	43	15	58	0.0170	0.0588	0.0208
Middle	24	12	36	0.0071	0.0342	0.0097
Middle Branch	37	1	38	0.0103	0.0027	0.0096
Post Primary	64	5	69	0.0094	0.0055	0.0089
Primary	59	12	71	0.0029	0.0038	0.0030
Primary Branch	0	0	0	0.0000	0.0000	0.0000
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	403	353	756	0.0099	0.0566	0.0161

schools that had full laboratories. The percentage of these schools was only 1.61% nationwide and almost nonexistent. Only 16.99% of high schools and 30.11% of urban high schools had proper laboratories. As expected, the number of high schools that had properly equipped laboratories in rural areas was extremely low at 9.64%. To achieve technological security in the 21st century, comprehensive science education was emphasized in NESP2, and the improvement of science laboratory is an urgent task.

3.4 Electricity

Electricity is necessary not only for lighting, but also for running computers and other educational equipment. However, only 34.85% of all schools had electricity. The most relevant factor for the presence or absence of electricity was rural or urban areas, which was 28.26% in rural areas versus 77.87% in urban areas.

Since electricity was thought to be available in upper-ranking schools and in larger schools where the number of students was large, the value may be greater than what was given in Table 10 if the ratio of electricity availability was calculated based on the number of students. Table 11 shows the ratios of students enrolled in schools with electricity according to school category. As expected, 60.11% of all students were enrolled in schools with electricity. In the urban areas, it was very high at 93.16%. In rural areas, however, it was very low at 35% and even less for middle school or lower.

If there was no electricity in an area where a school was located, there was no electricity in the school. The availability of electricity was not a problem that can be managed by the school alone; it was basically a problem of the community where the school was located. The results of the Inter Censal Survey [3] can be used as a reference to determine whether or not a

Table 10. Ratio of Schools with Electricity by School Category

	Schools with electricity			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	1,065	966	2,031	0.5836	0.9443	0.7131
High Branch	1,087	228	1,315	0.4288	0.8941	0.4713
Middle	1,004	308	1,312	0.2975	0.8775	0.3521
Middle Branch	1,032	313	1,345	0.2867	0.8414	0.3387
Post Primary	1,768	703	2,471	0.2594	0.7666	0.3195
Primary	5,425	2,338	7,763	0.2625	0.7318	0.3254
Primary Branch	126	4	130	0.0661	0.0315	0.0639
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	11,507	4,860	16,367	0.2826	0.7787	0.3485

Table 11. Ratio of Students Enrolled in Schools with Electricity by School Category

	Students with electricity			Students with electricity (Ratio)		
School category	Rural	Urban	Total	Rural	Urban	Total
High	995,535	1,505,174	2,500,709	0.6791	0.9633	0.8258
High Branch	535,240	214,020	749,260	0.5109	0.9333	0.5867
Middle	286,853	177,090	463,943	0.3535	0.9449	0.4645
Middle Branch	259,686	144,666	404,352	0.3587	0.9199	0.4588
Post Primary	310,321	219,980	530,301	0.3403	0.8545	0.4535
Primary	420,912	345,963	766,875	0.3510	0.8664	0.4797
Primary Branch	5,748	253	6,001	0.0958	0.0492	0.0921
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	2,814,295	2,607,146	5,421,441	0.4524	0.9316	0.6011

community had electricity. In the survey, there was a question that asked about the power source of electric lights in each household. It was assumed that electricity was available for a household that answered "electricity was supplied by electric wires." Figure 8 shows the electrification rate of schools and households by State/Region and rural/urban area. The following was obvious.

・There were large differences in the electrification rate between rural and urban areas.

・The electrification rate of schools and homes was closely related.

・The situation varied greatly depending on the State/Region.

・The electrification rate of schools was lower than that of households, with the exception of Tanintharyi, Mon, the rural area of Chin, the rural area of Ayeyawaddy, and the urban area of Mandalay,

・In particular, Rakhine, Kayah, and Shan had lower electrification rates for school than households.

Although the availability of electricity was believed to have a significant impact on the learning environment, it did not seem to be a high priority for schools to have electricity at present. If there was no electricity in the area, it was unavoidable, but if there was electricity in the neighborhood, electricity should be installed in the school immediately to improve the learning environment.

3.5 Computer

Due in part to the circumstances amid the COVID-19 pandemic, there are high expectations to conduct online education using computers in schools. However, computer-based education is impossible without electricity. Even if electricity was available, the number of required computers was inadequate. Table 12 shows the number of computers in schools. Over 90% of all schools did not have computers at all. Even among urban high schools, 10.07% did not have any computers at all. Given this situation, the educational use of computers is limited. If we want to use computers for education in a classroom, at least 11 computers may be required including one for the teacher, and the sharing of one computer with several students depending on the number of students. But there were only 37 such schools in the rural areas and 150 in the urban areas in Myanmar.

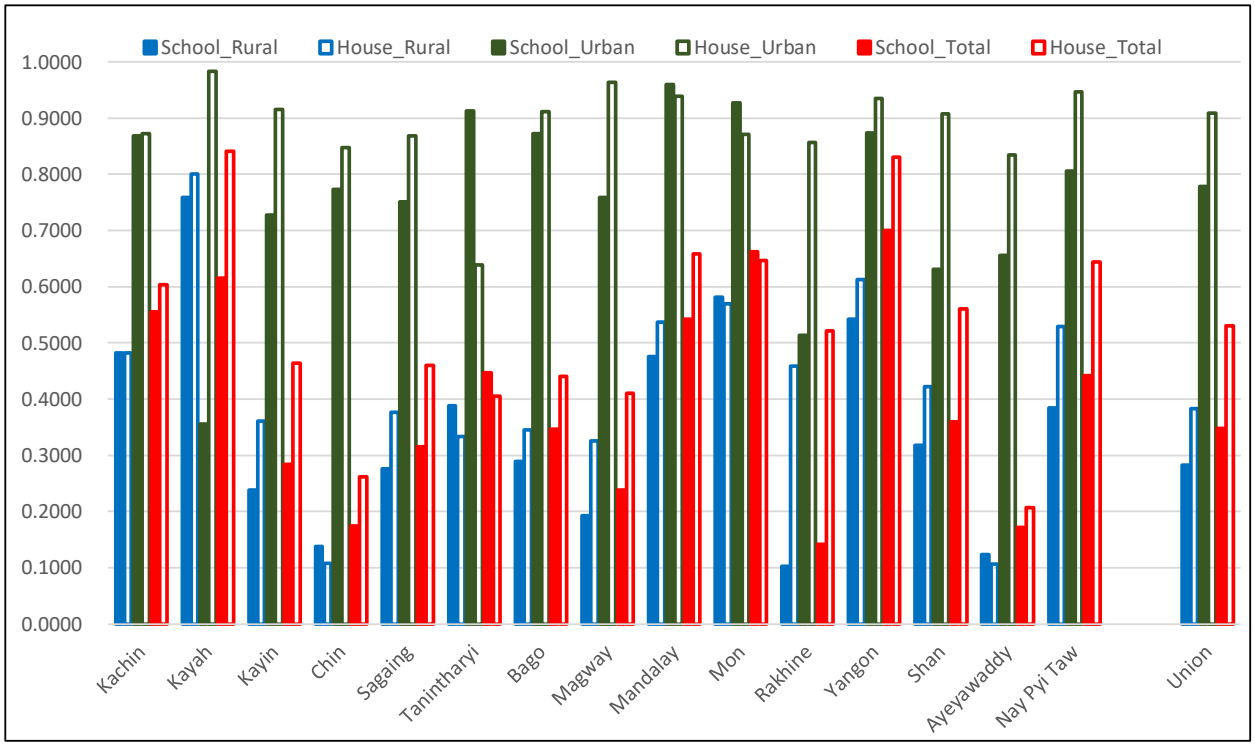

Figure 8. Electrification Rate of Schools and Households by State/Region and Rural/Urban Classification

Table 12. Percentage of Schools by Computer Count

	Number	High	High branch	Middle	Middle branch	Post primary	Primary	Primary branch	Primary affiliate	Total	%
Rural	0	422	1,543	2,957	3,461	6,727	20,589	1,906	1	37,606	92.35
	1	569	677	342	105	75	69	0	0	1,837	4.51
	2	342	149	40	15	9	3	0	0	558	1.37
	3	123	42	17	8	5	1	0	0	196	0.48
	4	86	48	5	2	0	1	0	0	142	0.35
	5	100	41	7	6	0	0	0	0	154	0.38
	6	82	11	2	1	0	0	0	0	96	0.24
	7	33	5	1	0	0	0	0	0	39	0.10
	8	16	1	1	0	0	0	0	0	18	0.04
	9	9	5	0	0	0	0	0	0	14	0.03
	10	14	7	3	0	0	0	0	0	24	0.06
	11-15	13	3	0	1	0	1	0	0	18	0.04
	16-20	8	1	0	0	0	0	0	0	9	0.02
	21-30	3	2	0	0	0	0	0	0	5	0.01
	30-40	5	0	0	0	0	0	0	0	5	0.01
	40-	0	0	0	0	0	0	0	0	0	0.00
	Total	1,825	2,535	3,375	3,599	6,816	20,664	1,906	1	40,721	100.00
Urban	0	103	77	159	326	840	3,097	127	1	4,730	75.79
	1	163	82	125	30	57	79	0	0	536	8.59
	2	178	37	38	13	15	9	0	0	290	4.65
	3	109	15	11	1	1	5	0	0	142	2.28
	4	73	12	7	1	0	0	0	0	93	1.49
	5	92	14	4	0	0	1	0	0	111	1.78
	6	57	7	1	0	0	0	0	0	65	1.04
	7	39	5	1	0	0	0	0	0	45	0.72
	8	23	1	0	1	0	1	0	0	26	0.42
	9	17	0	0	0	1	0	0	0	18	0.29
	10	33	1	0	0	1	0	0	0	35	0.56
	11-15	65	2	2	0	1	1	0	0	71	1.14
	16-20	36	1	1	0	0	0	0	0	38	0.61
	21-30	17	1	1	0	0	2	0	0	21	0.34
	30-40	7	0	1	0	1	0	0	0	9	0.14
	40-	11	0	0	0	0	0	0	0	11	0.18
	Total	1,023	255	351	372	917	3,195	127	1	6,241	100.00
Total	0	525	1,620	3,116	3,787	7,567	23,686	2,033	2	42,336	90.15
	1	732	759	467	135	132	148	0	0	2,373	5.05
	2	520	186	78	28	24	12	0	0	848	1.81
	3	232	57	28	9	6	6	0	0	338	0.72
	4	159	60	12	3	0	1	0	0	235	0.50
	5	192	55	11	6	0	1	0	0	265	0.56
	6	139	18	3	1	0	0	0	0	161	0.34
	7	72	10	2	0	0	0	0	0	84	0.18
	8	39	2	1	1	0	1	0	0	44	0.09
	9	26	5	0	0	1	0	0	0	32	0.07
	10	47	8	3	0	1	0	0	0	59	0.13
	11-15	78	5	2	1	1	2	0	0	89	0.19
	16-20	44	2	1	0	0	0	0	0	47	0.10
	21-30	20	3	1	0	0	2	0	0	26	0.06
	30-40	12	0	1	0	1	0	0	0	14	0.03
	40-	11	0	0	0	0	0	0	0	11	0.02
	Total	2,848	2,790	3,726	3,971	7,733	23,859	2,033	2	46,962	100.00

It is not sufficient to simply have computers to provide computer education. Teachers must have the ability to teach the use of computers. However, as shown in Table 13, the total number of schools capable of teaching the use of computers was as low as 3.59%. In high schools, the percentage was 37.08%, but in rural areas, it was 26.08% and much lower than the 56.70% in urban areas. If computers were used in education, the required number of computers must be provided while training teachers at the same time.

3.6 Internet

In the case of online education using computers, an extremely important factor is whether or not the school has an environment that allowed the use of the internet. Table 14 shows the results of development of the internet environment by school category. The national average for internet access was 1.84%, and only 3.41% of all schools even in urban areas. Even among high schools, which was the highest ranked in the school category, this figure was only 8.64% nationally and 13.88% in urban areas. This made it very difficult to use schools as base-stations for online distance learning at home nationwide.

In terms of numbers, since there were many students enrolled in large schools, the percentage of students who had access to the internet at school was useful to calculate. As shown in Table 15, the overall percentage was 5.01%, 9.78% in urban areas, and 11.35% in high schools as a whole and 15.96% in urban high schools. These values were even higher if the calculation was restricted to high school course enrollees (G10 and G11). Yet the difference was only about 1% point.

3.7 Teachers Who Received Training

In addition to the physical learning environment, the environment attributed to teachers was also important. Even though the fundamental requirement was to properly allocate high-quality teachers, it was necessary to first provide needed training to the

Table 13. Number of Schools that Can Teach Computers by School Category

	Computer can be taught			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	476	580	1,056	0.2608	0.5670	0.3708
High Branch	234	86	320	0.0923	0.3373	0.1147
Middle	80	91	171	0.0237	0.2593	0.0459
Middle Branch	30	14	44	0.0083	0.0376	0.0111
Post Primary	21	16	37	0.0031	0.0174	0.0048
Primary	23	36	59	0.0011	0.0113	0.0025
Primary Branch	1	0	1	0.0005	0.0000	0.0005
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	865	823	1,688	0.0212	0.1319	0.0359

Table 14. Schools with Access to the Internet and Their Ratio of the Total by School Category

	Schools with internet			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	104	142	246	0.0570	0.1388	0.0864
High Branch	72	14	86	0.0284	0.0549	0.0308
Middle	94	10	104	0.0279	0.0285	0.0279
Middle Branch	87	5	92	0.0242	0.0134	0.0232
Post Primary	88	11	99	0.0129	0.0120	0.0128
Primary	185	30	215	0.0090	0.0094	0.0090
Primary Branch	19	1	20	0.0100	0.0079	0.0098
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	649	213	862	0.0159	0.0341	0.0184

Table 15. Number of Students with Internet Access at Schools and Their Ratio of the Total by School Category

	Students with internet			Ratio		
School category	Rural	Urban	Total	Rural	Urban	Total
High	94,283	249,365	343,648	0.0643	0.1596	0.1135
	(29,461)	(84,016)	(113,477)	(0.0722)	(0.1714)	(0.1263)
High Branch	32,224	9,334	41,558	0.0308	0.0407	0.0325
	(4,984)	(1,764)	(6,748)	(0.0332)	(0.0529)	(0.0368)
Middle	20,708	5,282	25,990	0.0255	0.0282	0.0260
Middle Branch	14,265	1,516	15,781	0.0197	0.0096	0.0179
Post Primary	7,902	3,852	11,754	0.0087	0.0150	0.0101
Primary	8,043	4,435	12,478	0.0067	0.0111	0.0078
Primary Branch	397	22	419	0.0066	0.0043	0.0064
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	177,822	273,806	451,628	0.0286	0.0978	0.0501

teachers already in place to enhance their teaching capacities. In particular, the gradual introduction of the new curriculum starting with the introduction of the new KG curriculum in the 2016 academic year required training related to content and educational methods; and much effort has been made thus far. At the same time, due to the transfer, promotion, and hiring of new teachers, the teachers who will be in charge of the new curriculum may not necessarily be teachers who received training in the past. Of course, if it was possible, all teachers should be familiar with the content and teaching methods of the new curriculum for all grades.

As will be discussed later, there was a non-negligible number of teachers who did not receive the necessary training. However, since training concerning the new curriculum was intended for all existing teachers, it was be inferred that many of those who did not receive training here were newly hired teachers; and if they were from educational colleges, they may have taken related classes there.

Figure 9 shows the proportional distribution of primary school course teachers who received training in the new KG curriculum according to school category. Specifically, the figure shows the number of teachers trained in the new KG curriculum divided by all regular teachers within the primary school course including principals for each school with a primary school course. There were a small number of schools that exceeded 100%, in the calculation and were treated as 100%. As the number of teachers who received training was not organized according to teaching course, it was not surprising that the figure would exceed 100% if teachers who have received training in the past were promoted to middle school course teacher or other positions.

Overall, there were 10.50% of schools with 0% trained teachers, and 19.51% of schools with more than 90% trained teachers. The median was between 30% and 40%. In terms of school category, the upper-ranking schools appeared to have smaller ratios, but this may have been due to the larger total of primary school course teachers. The reason why the branch primary schools with 0% account for 42.20% was probably due to the large number of newly hired teachers. Since a large number of schools had only one KG class in the entire school, it is believed that many KG teachers received training on the new KG curriculum nationwide. However, there were no teachers, who received training, in more than 10% of the schools at the national level.

Figure 10 also shows the proportional distribution of teachers trained in the new G1 curriculum. Overall, there were 8.50% of schools with 0% trained teachers and 26.59% of schools with more than 90% trained teachers. The median values were between 40% and 50% and were higher than KG. According to school category, the upper-ranking schools appeared to have smaller percentages, which may have been due to the large curriculum and the total number of primary school course teachers as in the case of KG. The reason why 37.32% of branch primary schools showed

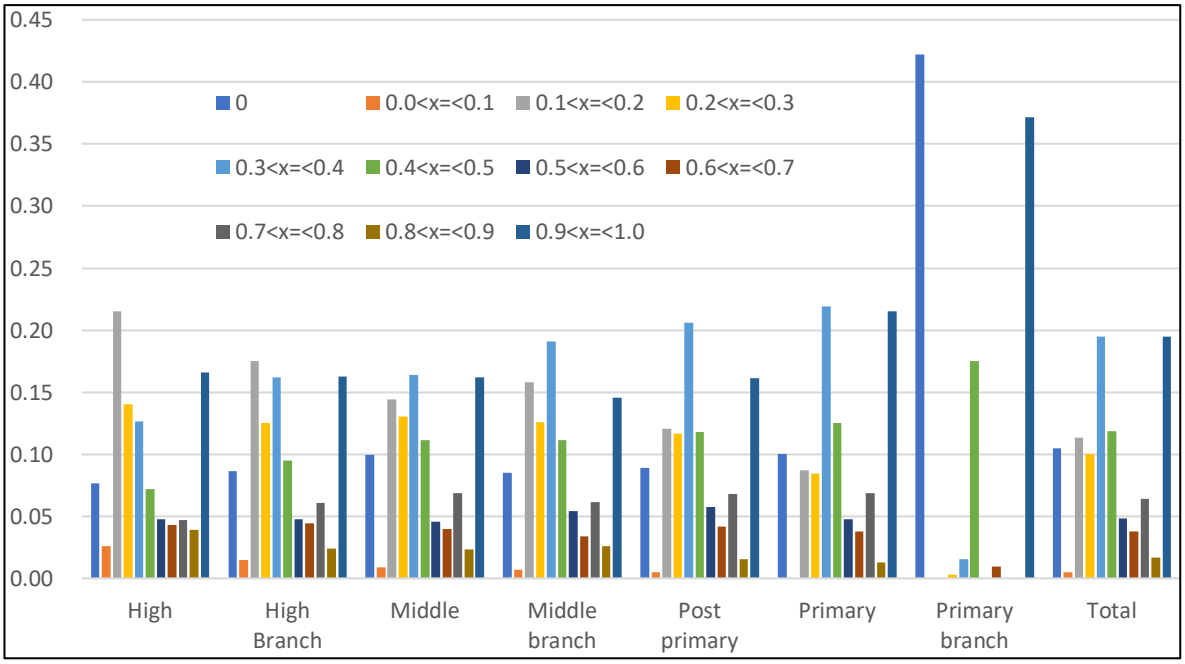

Figure 9. Distribution of Ratio of Primary School Course Teachers Trained in the New KG Curriculum by School Category

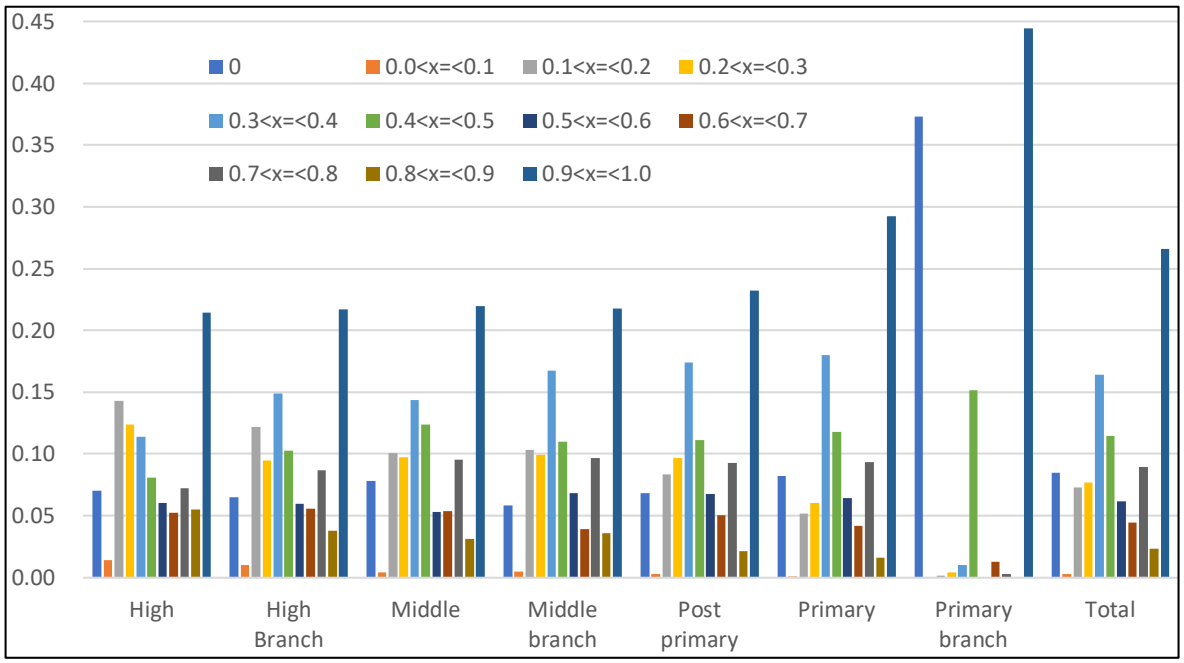

Figure 10. Distribution of Ratio of Primary School Course Teachers Trained in the New G1 Curriculum by School Category

0% was because many of them were newly hired teachers. 90% or more of the G1 teachers nationwide received training in the new G1 curriculum since most schools were believed to have one G1 class. However, 8.5% of schools had no trained teachers.

Figure 11 similarly shows the proportional distribution of primary school course teachers trained in the new G2 curriculum. Overall, there were 5.35% of schools with 0% trained teachers, while there were 60.60% of schools with more than 90%; and the

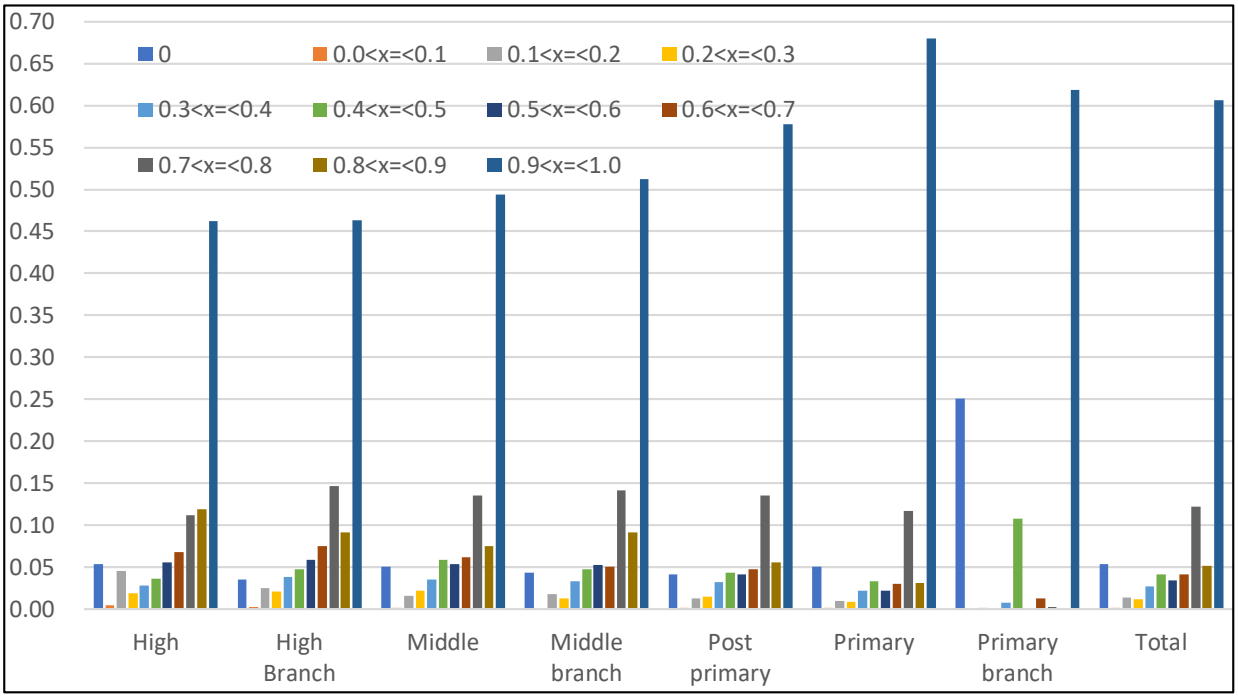

Figure 11 Distribution of Ratio of Primary School Course Teachers Trained in the New G2 Curriculum by School Category

median was between 90% and 100% and also much higher. In terms of school category, the upper-ranking schools appeared to have smaller percentages; and as in the case of KG and G1, this may have been due to the large total of primary school course teachers. But even in high schools, 53.75% of the schools had more than 90% of the primary school course teachers who took the training curriculum. The reason that 0% of the branch primary schools still accounted for 25.09% was probably because there were many newly hired teachers.

Figure 12 also shows the distribution of the proportion of primary school course teachers trained in the new G3 curriculum, but the results of the training were further enhanced. Overall, there were 6.98% of schools with 0% trained teachers, while simultaneously, 82.18% of schools had more than 90% of trained teachers; and the median was between 90% and 100% and also much higher. In terms of school category, it appeared that upper-ranking schools had somewhat smaller percentages. Even in the high schools, 50.19% of the schools had a sufficiently large number of teachers who took the training at over 90%. However, there were 14.91% of branch primary schools with 0%.

Figure 13 similarly shows the proportional distribution of middle school course teachers (not including principals) who were trained in the new G6 curriculum, and the results of the training were remarkably substantial. Overall, there were 5.50% of schools with 0% trained teachers, while simultaneously, there were 66.62% of schools with more than 90% of trained teachers; and the median was remarkably high ranging from 90% to 100%. In terms of school category, the upper-ranking schools appeared to have somewhat more schools with small percentages. Even in high schools, 78.25% of the schools had a relatively high number of teachers, over 90%, who undertook the training. There were 8.66% of post primary schools with 0% untrained teachers.

From the above, it was seen that although the training was very successful, a small number of schools did not have a single trained teacher. The main reason for this may have been that new teachers recruited after completing their training in the new curriculum were assigned to small schools such as post primary schools. Even if they took a class on how to teach the new curriculum at the teachers' college, it would be daunting to teach the new curriculum right

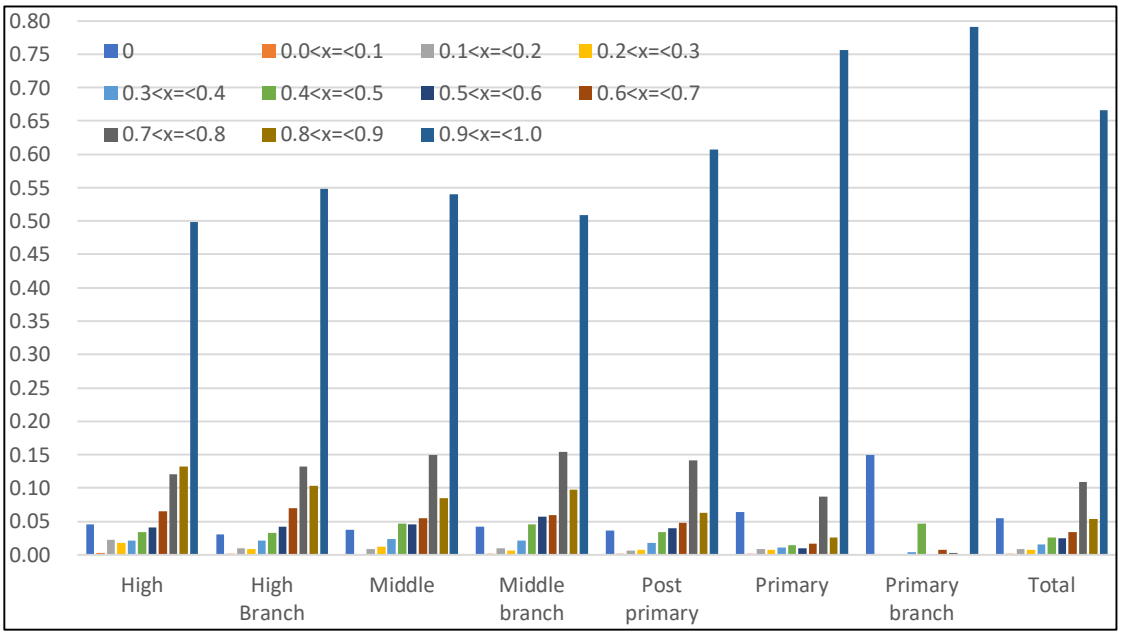

Figure 12. Distribution of Ratio of Primary School Course Teachers Trained in the New G3 Curriculum by School Category

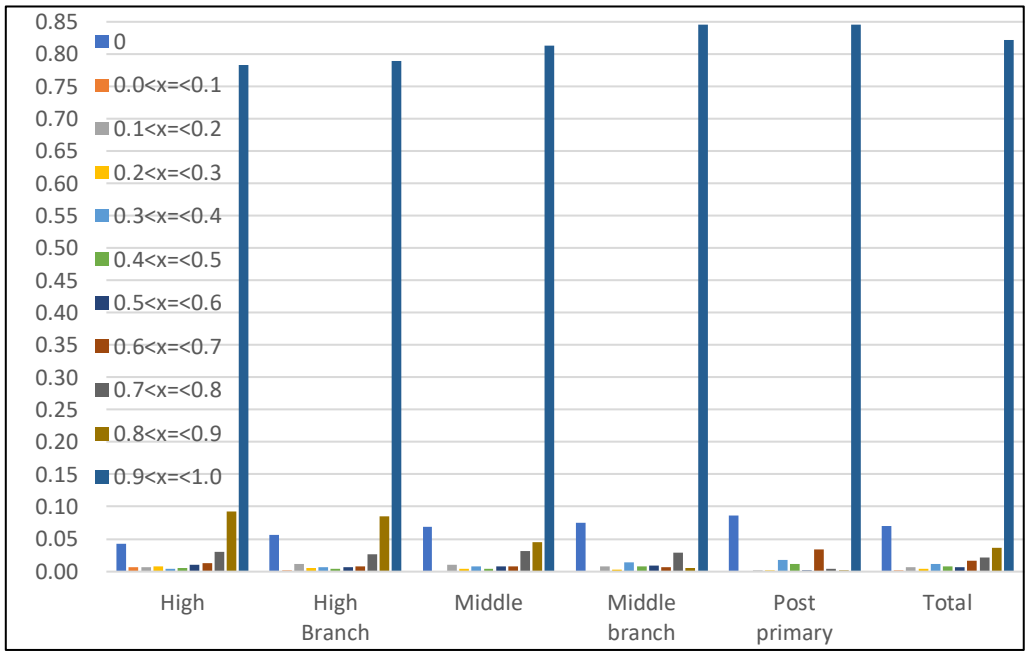

Figure 13. Distribution of Ratio of Middle School Course Teachers Trained in the New G6 Curriculum by School Category

away without the guidance of senior teachers.

If the school was adequately large and there were senior teachers who had received training and gained experience, they may be able to cope with the new curriculum through in-service training. But for smaller schools, school-based training was not possible because there were no senior teachers who were able to teach them. Strengthening the system of school clusters in a community, which unite neighboring schools, and continue necessary training, such as conducting lesson studies within the clusters is required.

Table 16. Estimates of the Number of Teachers without Training and Their Ratio by School Category

School category	Estimated number of untrained teachers					Ratio of untrained teachers				
	KG	G1	G2	G3	G6	KG	G1	G2	G3	G6
High	14,063	12,148	6,146	5,370	4,745	0.5780	0.4993	0.2526	0.2207	0.1093
High Branch	10,357	8,889	4,319	3,485	2,196	0.5702	0.4893	0.2378	0.1919	0.1063
Middle	11,734	10,208	4,850	4,213	2,344	0.5664	0.4928	0.2341	0.2034	0.1085
Middle Branch	13,135	11,120	4,825	4,753	1,680	0.5722	0.4844	0.2102	0.2070	0.1092
Post Primary	22,284	19,131	7,499	6,839	1,928	0.5469	0.4695	0.1840	0.1678	0.1198
Primary	52,465	43,871	14,319	12,711		0.4902	0.4099	0.1338	0.1188	
Primary Branch	1,476	1,283	872	476		0.5288	0.4597	0.3124	0.1705	
Total	125,514	106,650	42,830	37,847	12,893	0.5302	0.4505	0.1809	0.1599	0.1101

Table 16 shows the estimated total number of untrained teachers by subtracting the number of trained teachers from the number of teachers in the relevant course according to school. Schools with negative values in the calculation were replaced with zero. The most recent data on training was for G3 and G6. Newly-appointed primary school course teachers were included in G3, but given the supply capacity of the teachers' college, 37,847 new teachers were not generated. It is about 15,000 at most [4]. Only 562 daily wage teachers were included in this figure. The rest were already hired teachers. The percentage of untrained teachers was higher in the larger and upper-ranking school categories, but since new teachers were not likely to be assigned to these schools, not all of the target teachers were trained as planned.

3.8 School Size and Number of Students per Teacher

The most significant factor contributing to the effectiveness of education was the teacher, and the number of students per teacher was one of the most important variables explaining the effectiveness of education [5]. Compared to the rapid increase in the number of students, the supply of teachers had not kept pace. There was a time when the S/T ratio was extremely high, especially in middle school course [6], but as shown in Figure 14, the number of students per teacher by school size, has recently improved significantly thanks to the efforts of the Ministry of Education.

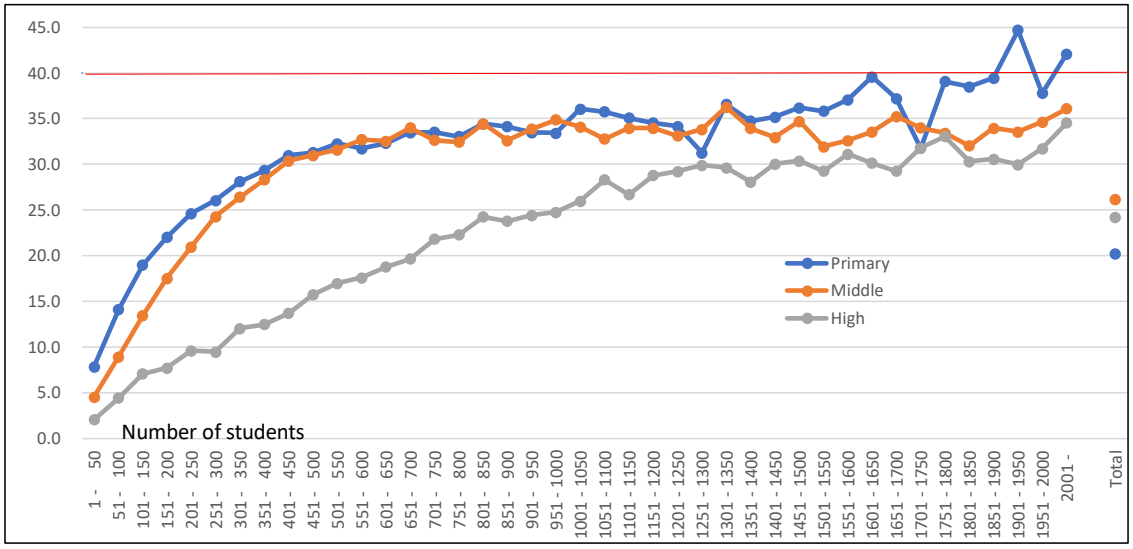

Figure 14. Number of Students per Teacher by Size of School

Table 17. Number of Students per Teacher by School Category

	Primary			Middle			High		
School category	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
High	29.37	35.39	31.88	30.46	32.29	31.40	23.81	28.96	26.37
High Branch	27.77	33.99	28.76	26.96	32.76	27.80	15.58	21.16	16.46
Middle	24.19	29.79	25.06	20.79	28.23	21.89			
Middle Branch	21.13	26.63	21.99	21.81	36.91	23.36			
Post Primary	19.10	26.48	20.42	16.77	28.94	18.30			
Primary	13.50	21.15	14.85						
Primary Branch	15.48	21.22	15.81						
Total	18.58	26.93	20.21	23.99	31.95	26.17	21.20	28.33	24.22

Table 17 shows the number of students per teacher according to school category. In order to ensure the correlation between the number of students and the number of teachers, data where either the number of students or the number of teachers in each educational course was zero (unstated) were not included in the calculation. The reason for the higher values for urban schools compared to rural schools shown in Table 17 was that generally urban schools had larger student populations.

According to the method of assigning teachers stipulated by the Ministry of Education, the maximum number of students per teacher was 40 in basic education schools, which should be the asymptotic line shown in Figure 14 and should not exceed it [7]. In reality, however, this value was exceeded in the primary school course. At large-scale schools, the number of students exceeded expectations, and the supply of teachers had not kept up, or the number of students may have exceeded school capacity and increased.

Figure 15 shows the distribution of schools by the number of students and size. It appears that the situation had not greatly changed and the number of small schools continued to be extremely high (Muta, 2018a): 11.15% of the schools were very small (1-25 students), 54.53% indicated up to 100 students, 75.08% indicated up to 200 students, and 90.30% indicated up to 450 students. The basic reason for the small number of students per teacher in Figure 14 and

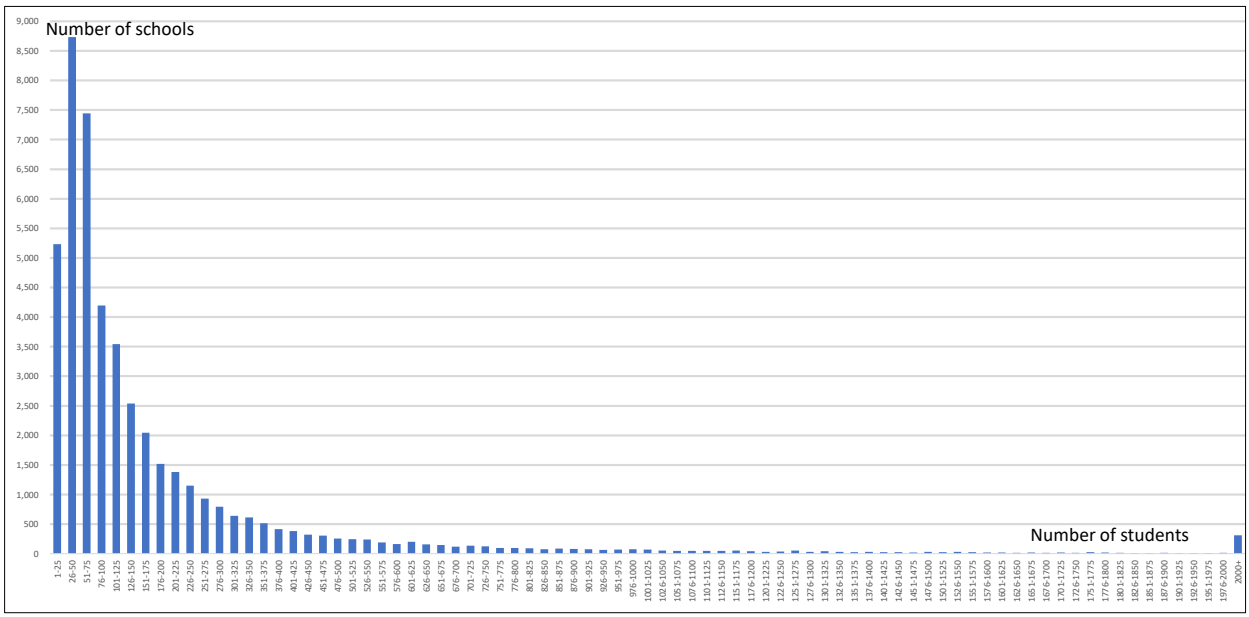

Figure 15. Distribution of the Number of Schools by School Size

Table 17 was the existence of such small schools. In other words, even if the number of students was small, a certain number of teachers was assigned depending on the category of the school, and if the number of students increased, one teacher was generally added to every 40 students according to the standard. Therefore, the number of students per teacher started from a low value and gradually increased with the rise in the number of students, as it approached the asymptotic line of 40 students. When the number of students was small, the number of students per teacher in the high school course was smaller than in the primary and middle school course because a certain number of teachers were assigned to each subject from the beginning even when the number of students was small due to the subject-teacher system. In Table 17, the overall number of students per teacher was not large, and it appeared that careful and high quality education was provided, but the main reason for this was the small size of the school. The issue of small school size was analyzed in detail in Muta (2019), and we were not simply pleased with this value because it was small.

3.9 Facilities and Equipment for Education of Students with Disabilities

The statistics for the 2019 academic year includes the number of students with disabilities for each school, but not per grade level. As shown in Table 18, 6,914 schools across the country, or 14.72% of all schools, enrolled students with disabilities. Although there were more schools with students with disabilities in rural areas, this was due to the fact that there were generally more rural schools than urban schools as shown in Table 1. Looking at the percentage of schools that had students with disabilities in each school category, the percentage was higher in urban schools in all categories. This may have been due to the fact that urban schools were more aware and prepared to educate students with disabilities. However, it may also be that urban schools were larger. In terms of school category, the higher the school category, the higher the value, but this may also be due to the fact that the higher the ranking, the larger the number of students.

For schools with students with disabilities, the average number of students with disabilities enrolled in schools was calculated to be 2.67. This value was higher in urban schools with 3.56 students than in rural schools. Looking at this number by school category, the number of students with disabilities was larger the higher the school ranking, but again, the higher the ranking, the total number of students was larger.

Table 19 shows the ratio of students with disabilities to the total number of enrolled students in all schools shown in Table 20. The national average was very low at 0.20%, and the percentage was higher in rural schools than in urban schools. By school category, primary school was the highest, reaching 0.37% nationwide and 0.43% in rural areas. The main reason for this difference appeared to be the age composition of the students. Upper-ranking schools naturally have a large proportion of senior grades. On the other hand, it was probable that more students with disabilities were dropping out of school in the middle of their grades compared to normal students. Even if they managed to attend the primary school course, which was compulsory education, many students with disabilities may have left school when they reached an upper course as shown in Table 1. This was because the number of schools was limited, the commuting distance to school was far, and the learning content became difficult.

Thus, the value for the number of children with disabilities enrolled divided by the number of primary school course students enrolled in that school was calculated. As shown in Table 19, differences among school categories became smaller. In urban areas where higher values occurred at upper-ranking schools, this may have been due to the fact that a certain number of students with disabilities was also enrolled in middle and high school courses at these schools. In terms of national trends, the typical enrollment rate value for children with disabilities was 0.37% of primary schools.

Of course, not all children with disabilities attended school. The most recent data for all people with disabilities was obtained from the 2019 Inter Censal Survey Report [3]. Although strict comparisons were difficult to make because the definition of people with disabilities used in Inter Censal Survey differed from

Table 18. Ratio of Schools and Average Number of Students with Disabilities Enrolled by School Category

School category	Schools with any disabled			Ratio of schools			Average number of disabled		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
High	495	323	818	0.2712	0.3157	0.2872	3.54	4.91	4.08
High Branch	637	80	717	0.2513	0.3137	0.2570	3.01	3.35	3.05
Middle	681	82	763	0.2018	0.2336	0.2048	2.51	4.39	2.72
Middle Branch	604	69	673	0.1678	0.1855	0.1695	2.78	4.67	2.98
Post Primary	908	151	1,059	0.1332	0.1647	0.1369	2.49	3.30	2.61
Primary	2,413	387	2,800	0.1168	0.1211	0.1174	2.12	2.24	2.14
Primary Branch	75	9	84	0.0393	0.0709	0.0413	1.52	2.22	1.60
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000	0.00	0.00	0.00
Total	5,813	1,101	6,914	0.1428	0.1764	0.1472	2.51	3.56	2.67

Table 19. Ratio of Students with Disabilities among All Students by School Category

School category	Rural		Urban		Total	
	Divided by all students	Divided by prim. students	Divided by all students	Divided by prim. students	Divided by all students	Divided by prim. students
High	0.1197%	0.4254%	0.1014%	0.4437%	0.1103%	0.4339%
High Branch	0.1829%	0.4511%	0.1169%	0.2707%	0.1710%	0.4170%
Middle	0.2110%	0.4012%	0.1921%	0.3719%	0.2074%	0.3958%
Middle Branch	0.2322%	0.4075%	0.2048%	0.3355%	0.2273%	0.3939%
Post Primary	0.2484%	0.3537%	0.1938%	0.2589%	0.2364%	0.3317%
Primary	0.4269%	0.4269%	0.2171%	0.2171%	0.3745%	0.3745%
Primary Branch	0.1899%	0.1899%	0.3892%	0.3892%	0.2057%	0.2057%
Primary Affiliate	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Total	0.2341%	0.4072%	0.1401%	0.3146%	0.2049%	0.3833%

Table 20. Number of Students by School Category

School category	Rural				Urban				Total			
	Primary	Middle	High	Total	Primary	Middle	High	Total	Primary	Middle	High	Total
High	412,314	645,511	408,058	1,465,883	357,255	715,125	490,087	1,562,467	769,569	1,360,636	898,145	3,028,350
High Branch	424,763	472,856	150,116	1,047,735	99,000	96,942	33,375	229,317	523,763	569,798	183,491	1,277,052
Middle	426,669	384,787	0	811,456	96,800	90,624	0	187,424	523,469	475,411	0	998,880
Middle Branch	412,535	311,506	0	724,041	95,970	61,289	0	157,259	508,505	372,795	0	881,300
Post Primary	640,426	271,488	0	911,914	192,768	64,674	0	257,442	833,194	336,162	0	1,169,356
Primary	1,199,259	0	0	1,199,259	399,322	0	0	399,322	1,598,581	0	0	1,598,581
Primary Branch	60,019	0	0	60,019	5,139	0	0	5,139	65,158	0	0	65,158
Primary Affiliate	8	0	0	8	156	0	0	156	164	0	0	164
Total	3,575,993	2,086,148	558,174	6,220,315	1,246,410	1,028,654	523,462	2,798,526	4,822,403	3,114,802	1,081,636	9,018,841

Table 21. Number of People with Disabilities Based on Inter Censal Survey

	Five-years age groups	Total population				Ratio of people with disability among total disabilities					
		Total	Not disabled	With any of 6 disabilities	Disability prevalence ratio	Seeing	Hearing	Walking/ climbing steps	Remember-ing/ Con-centrating	Self-care	Communi-cation
Both Urban & Rural	5-9	4,479,179	4,180,734	298,445	0.0666	0.0941	0.0509	0.0920	0.2561	0.7184	0.1693
	10-14	4,728,541	4,590,524	138,016	0.0292	0.2964	0.1216	0.1726	0.3776	0.2962	0.2010
	15-19	4,722,778	4,544,343	178,435	0.0378	0.4353	0.1163	0.1552	0.3634	0.1517	0.1780
Urban	5-9	1,082,810	1,024,915	57,895	0.0535	0.1295	0.0509	0.0947	0.2315	0.7080	0.1958
	10-14	1,128,075	1,090,919	37,156	0.0329	0.3923	0.1385	0.1843	0.3587	0.2568	0.2096
	15-19	1,335,099	1,277,350	57,749	0.0433	0.5582	0.1179	0.1269	0.2878	0.1297	0.1283
Rural	5-9	3,396,369	3,155,819	240,550	0.0708	0.0856	0.0509	0.0913	0.2620	0.7209	0.1629
	10-14	3,600,466	3,499,605	100,861	0.0280	0.2610	0.1153	0.1683	0.3845	0.3106	0.1978
	15-19	3,387,678	3,266,993	120,686	0.0356	0.3764	0.1155	0.1687	0.3995	0.1622	0.2017

the definition of students with disabilities in school statistics, they were informative. Disability as defined by the Inter Censal Survey was, "Yes, some difficulty or higher" for the following symptoms.

1. Seeing, even if wearing glasses
2. Hearing, even if using a hearing aid
3. Walking or climbing steps
4. Remembering or concentrating
5. Self-care such as bathing or dressing
6. Communicating, for example understanding or being understood

There were many children with disabilities due to underdevelopment, and elderly people due to aging, but this was especially true for symptom number 5, where self-care was not possible. According to Table 21, the percentage of children with disabilities in the 5-9 age group, which was equivalent to the age of students enrolled in the primary school course, was high at 6.66%. But this was believed to be largely due to differences in the definition of self-care. In the next age category, 2.92% of 10-14 year old children, it was somewhat lower, and more convincing. Furthermore, according to the Inter Censal Survey Report (MoLIP, 2020), the lowest percentage of those aged 5 years and above who never attended school was among 9-year-olds, 1.1% in rural areas, 0.9% in urban areas, and 1.0% overall. Thus, even if 3% were disabled children, it was likely that many of them attended school for a short period of time, even 2% points, but many of them did not continue for long periods of time.

From an international perspective, it was difficult to determine how many people with disabilities there generally were in a country. This was because the definition of a person with disabilities differed from country to country and was likely to depend on a great deal of subjectivity. For example, according to Munakata et al. [8], in a survey of nine OECD countries on the extent to which "children with special needs" were enrolled in basic education schools, the highest rate was 28.84% in Finland, the lowest was 1.26% in Sweden, and Japan was in the middle of the nine countries at 3.58%. As OECD member countries, all countries surveyed were expected to educate most of the disabled in special classes and special schools as well as in regular classes. Although there were various opinions on whether "children with special needs" was synonymous with so-called children with disabilities, 3.58% seemed to be an acceptable value.

Therefore, it did not seem strange that 2.92% of the primary school-age population in Myanmar were children with disabilities. In any case, the fact that less than 1/10 of the truly disabled were currently enrolled in school makes the call for "No one left behind" seem too far from the reality. Of course, encouraging more people with disabilities to go to school will require more than just campaigning. It will require a lot of effort, including special allowances for the severely disabled, training of specialized teachers, and the opening of specialized facilities. Special education is also given special mention in the NESP2 that is currently being prepared. It is hoped that early action will be taken in the near future.

The SEA-PLM, an academic survey of fifth-grade students in six Southeast Asian countries conducted in 2019, also included a survey of the teachers in charge, which included a question on whether they had received training in inclusive education and education of students with special needs [9]. Out of the 397 valid responses, 62 had studied at a teachers' college, 100 had received training after becoming a teacher, and 25 had received training in both, while 210 (52.9%, the national estimate adjusted for sampling error was 52.8%) said they had never received such training. It will be necessary to improve training on education that is friendly to students with disabilities both in teachers' colleges and in-service settings.

Table 22 answers whether or not there were special facilities and equipment for students with disabilities. It was only 3.94% in total and 5.24% even in urban areas. According to school category, the national average for high schools was 8.25%, and it was 9.48% in urban area. The number of high school students was generally large and there were many students with disabilities. There was also room for special facilities and equipment to be built. Of course, it may be argued that this value is sufficient.

There were many types of students with disabilities. Table 23 shows the number of disabled students by disability. Overall, half of the students were mentally

Table 22. Number of Schools with Special Facilities and Equipment for Students with Disabilities by School Category

	Schoools with special facilities			Ratio of schools		
School category	Rural	Urban	Total	Rural	Urban	Total
High	138	97	235	0.0756	0.0948	0.0825
High Branch	152	19	171	0.0600	0.0745	0.0613
Middle	159	21	180	0.0471	0.0598	0.0483
Middle Branch	170	17	187	0.0472	0.0457	0.0471
Post Primary	250	57	307	0.0367	0.0622	0.0397
Primary	623	116	739	0.0301	0.0363	0.0310
Primary Branch	29	0	29	0.0152	0.0000	0.0143
Primary Affiliate	0	0	0	0.0000	0.0000	0.0000
Total	1,521	327	1,848	0.0374	0.0524	0.0394

retarded, and the rest had physical disabilities and weak eyesight. However, when divided into rural and urban areas, the percentage of physically disabled students relatively increased in urban areas. According to school category, the percentage of mentally retarded students decreased as the school ranking went up, but, the percentage of students with physically disabilities, low vision, and deaf students increased. Since it was unlikely that the percentage of disabled students by disability changed significantly with age, it was likely that the number of mentally weak students who dropped out of school increased as the school year progressed, while the percentage of physically disabled, low vision, and deaf-mute children who remained in school increased. This was inferred from the fact that a few number of students with physical disabilities, low vision, and deaf-mutes passed the matriculation examinations every year. One of the reasons for the large number of deaf-mutes in urban areas was the existence of a number of specialized schools. Inclusive education for students with mild disabilities, special classes and schools for students with different types and degrees of disabilities, and training of teachers on how to educate students with these disabilities will be increasingly necessary in the future.

3.10 Health Management

3.10.1 Status of Water-related School Health Improvement Activities

Considering that many children spend most of their daytime at school, it is important to manage their health. When children's health is improved, it is expected that absenteeism is reduced, and academic performance is improved. This section looks at the availability of drinking water, water supply systems, waste disposal systems, school health education courses, handwashing facilities and handwashing education. Figure 16 shows the results by state/region, and shows that the six water-related health improvement activities were generally well conducted, with the lowest rate of 85.1% for water supply systems and the highest rate of 94.2% for school health education courses nationwide.

Drinking water was often disinfected and filtered from tap water or well water, but it was also often used in water pots with cooled boiled water. Even if a water supply system was available, 4.0% of the schools did not use it as drinking water, while 30.5% of the schools had drinking water even if a water supply system was not available.

By state/region, the overall rate of availability was low in Kayah, Chin, and Rakhine States, although it varied by indicator. For example, in Kayah State, the availability of a water supply system was 55.4% and the availability of drinking water was only 57.3%. This may be due in part to the fact that many schools were built in mountainous areas where it was not possible to dig wells or to supply water by pipes. Even so, it was likely that it was possible to conduct school health education courses even without water, but the percentage was only 73.7%.

Table 23. Number and Ratio of Students with Type of Disability by School Category

School category	Rural							Urban							Total						
	Pysical	Weak sight	Mental	Blind	Deaf	Others	Total	Pysical	Weak sight	Mental	Blind	Deaf	Others	Total	Pysical	Weak sight	Mental	Blind	Deaf	Others	Total
High	610	328	598	10	48	160	1,754	528	265	356	51	275	110	1,585	1,138	593	954	61	323	270	3,339
High Branch	534	249	899	47	70	117	1,916	98	26	96	9	20	19	268	632	275	995	56	90	136	2,184
Middle	425	211	860	11	79	126	1,712	83	42	80	131	12	12	360	508	253	940	142	91	138	2,072
Middle Branch	335	188	1,000	14	77	67	1,681	36	54	206	2	10	14	322	371	242	1,206	16	87	81	2,003
Post Primary	419	259	1,346	18	89	134	2,265	108	61	281	2	20	27	499	527	320	1,627	20	109	161	2,764
Primary	865	374	3,262	66	208	345	5,120	162	94	517	7	28	59	867	1,027	468	3,779	73	236	404	5,987
Primary Branch	26	6	68	0	4	10	114	6	1	12	0	0	1	20	32	7	80	0	4	11	134
Primary Affiliate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,214	1,615	8,033	166	575	959	14,562	1,021	543	1,548	202	365	242	3,921	4,235	2,158	9,581	368	940	1,201	18,483
High	34.8	18.7	34.1	0.6	2.7	9.1	100.0%	33.3	16.7	22.5	3.2	17.4	6.9	100.0%	34.1	17.8	28.6	1.8	9.7	8.1	100.0%
High Branch	27.9	13.0	46.9	2.5	3.7	6.1	100.0%	36.6	9.7	35.8	3.4	7.5	7.1	100.0%	28.9	12.6	45.6	2.6	4.1	6.2	100.0%
Middle	24.8	12.3	50.2	0.6	4.6	7.4	100.0%	23.1	11.7	22.2	36.4	3.3	3.3	100.0%	24.5	12.2	45.4	6.9	4.4	6.7	100.0%
Middle Branch	19.9	11.2	59.5	0.8	4.6	4.0	100.0%	11.2	16.8	64.0	0.6	3.1	4.3	100.0%	18.5	12.1	60.2	0.8	4.3	4.0	100.0%
Post Primary	18.5	11.4	59.4	0.8	3.9	5.9	100.0%	21.6	12.2	56.3	0.4	4.0	5.4	100.0%	19.1	11.6	58.9	0.7	3.9	5.8	100.0%
Primary	16.9	7.3	63.7	1.3	4.1	6.7	100.0%	18.7	10.8	59.6	0.8	3.2	6.8	100.0%	17.2	7.8	63.1	1.2	3.9	6.7	100.0%
Primary Branch	22.8	5.3	59.6	0.0	3.5	8.8	100.0%	30.0	5.0	60.0	0.0	0.0	5.0	100.0%	23.9	5.2	59.7	0.0	3.0	8.2	100.0%
Primary Affiliate																					
Total	22.1	11.1	55.2	1.1	3.9	6.6	100.0%	26.0	13.8	39.5	5.2	9.3	6.2	100.0%	22.9	11.7	51.8	2.0	5.1	6.5	100.0%

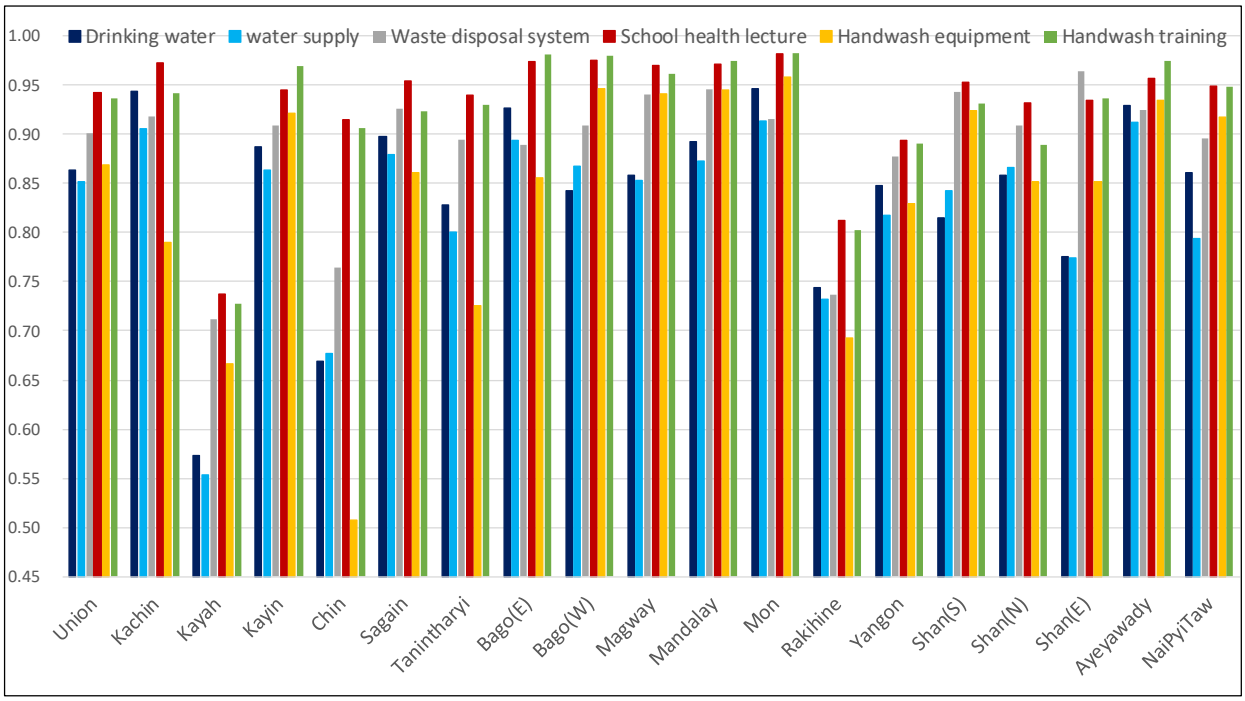

Figure 16. Status of Water-Related School Health Improvement Activities
by State/Region (46,960 Schools Nationwide)

The same was seen by school type in Figure 17. As expected, high schools were the most advanced and branch primary schools were the least advanced. In the branch primary schools, only 70.4% of the schools had drinking water and 70.9% had a water supply system. In comparison to the physical availability status, the availability of related courses was relatively better, with 80.2% for school health courses and 81.6% for handwashing instruction.

There was a clear difference between branch primary schools and primary schools in all activities. Many schools in Myanmar generally started as branch

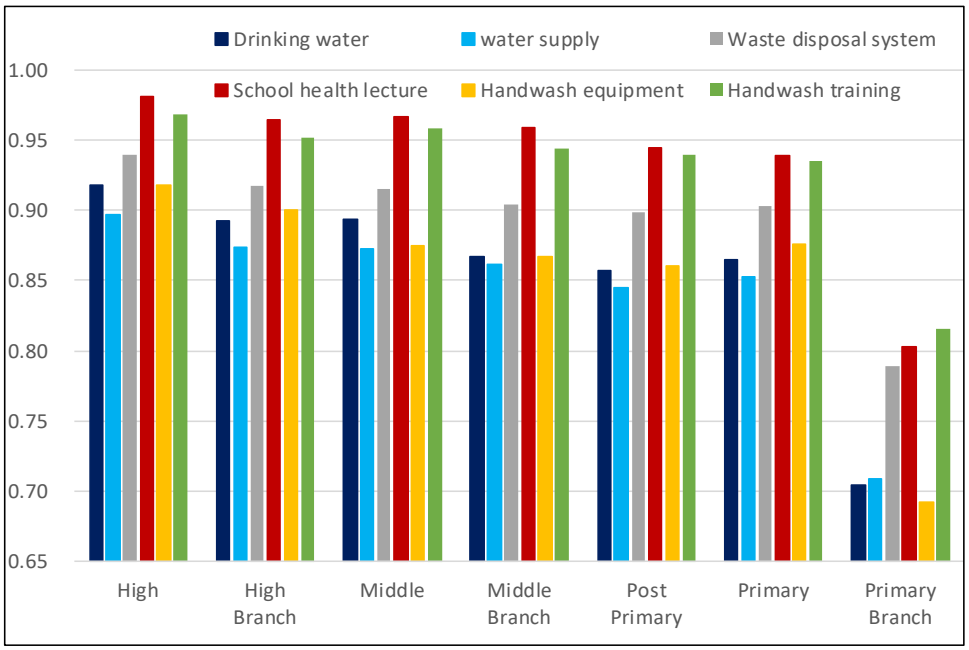

Figure 17. Status of Water-related School Health Improvement Activities by School Type

primary schools with a small primary school course that gradually increased in size with an increase in primary students and the addition of middle and high school courses, as well as the type of school changes that came with a "promotion." In many cases, the branch primary school was the earliest type of school. Therefore, even if the educational environment was not sufficiently developed, a school might be opened first, followed by a gradual improvement of the educational environment; and when the number of students increased to a certain level, the school was promoted to a primary school, then a middle school, and finally to a high school.

If this is the case, the older the school is, the better the water-related school health improvement activities should be. Figure 18 shows the status of the six water-related activities for each established year of branch primary schools to confirm this, but contrary to expectation, the older the school, the less developed were the water-related school health improvement activities. In fact, the newer the school, the more the need was recognized and the more water-related school health improvement activities were developed. As for the disparity with primary schools, it may be that the needed improvement was carried out when a school was promoted to a primary school.

Therefore, Figure 19 similarly looked at the status of six water-related activities according to the year a school was established/promoted to a primary school, which was nearly half of all schools and the largest in number. Unlike branch primary schools, there were many schools with an older history of establishment, but as expected, older schools had a higher ratio of improvement. This was especially true in terms of hardware. It is expected that water-related health improvements would take time.

3.10.2 Food Service Facilities and Snack Shops

Many schools have school lunch facilities and snack shops on campus. However, if they are unsanitary, they can be the cause food poisoning [10]. The data set includes findings on the following two activities.

A. Safety of food service facilities and snack shops: Is the food service facility or snack shop more than 50 feet away from a source of contamination such as a toilet or garbage dumpster (Y/N)?

B. Food safety: Does the food sold meet the food safety standards of the Ministry of Health and Sport (Y/N)?

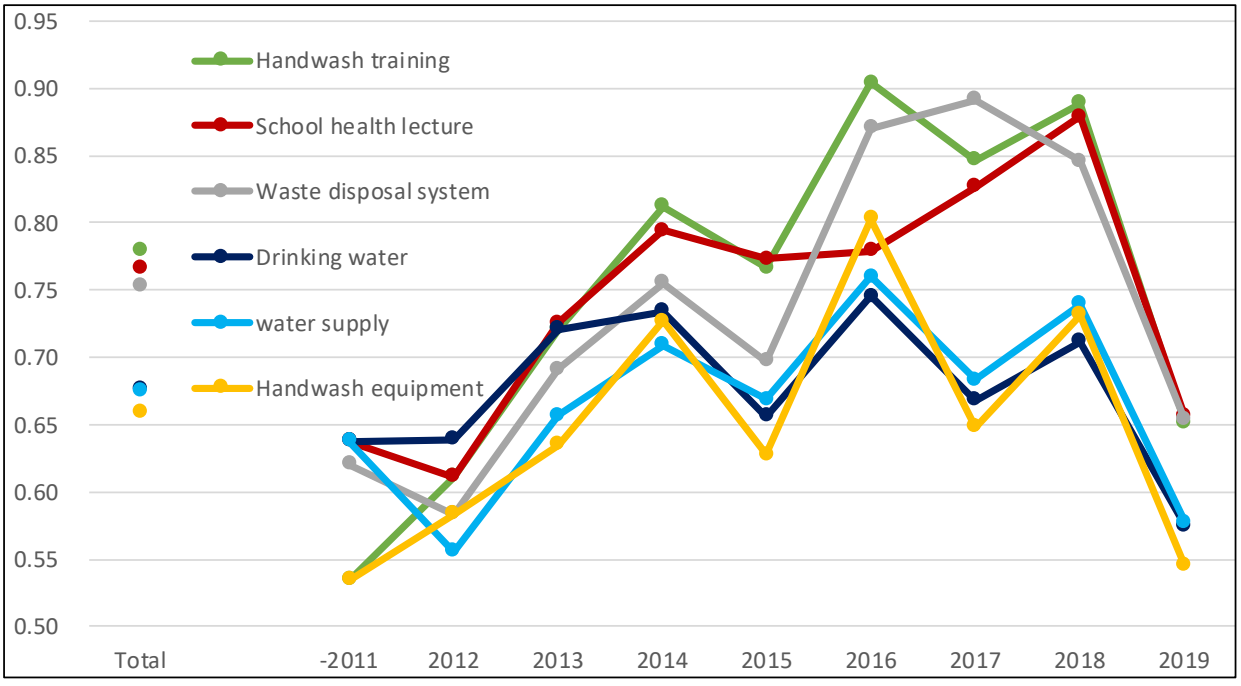

Figure 18. Development of Water-related School Health Improvement Activities by Year of Establishment of Branch Primary Schools

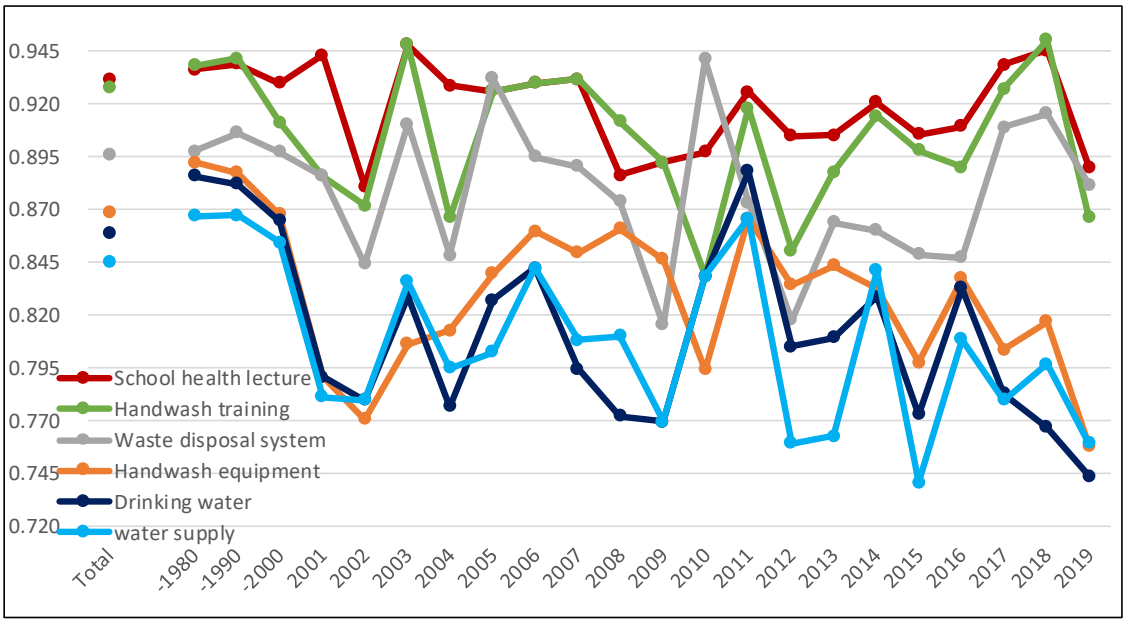

Figure 19. Development of Water-related School Health Improvement Activities by Year of Primary School Establishment

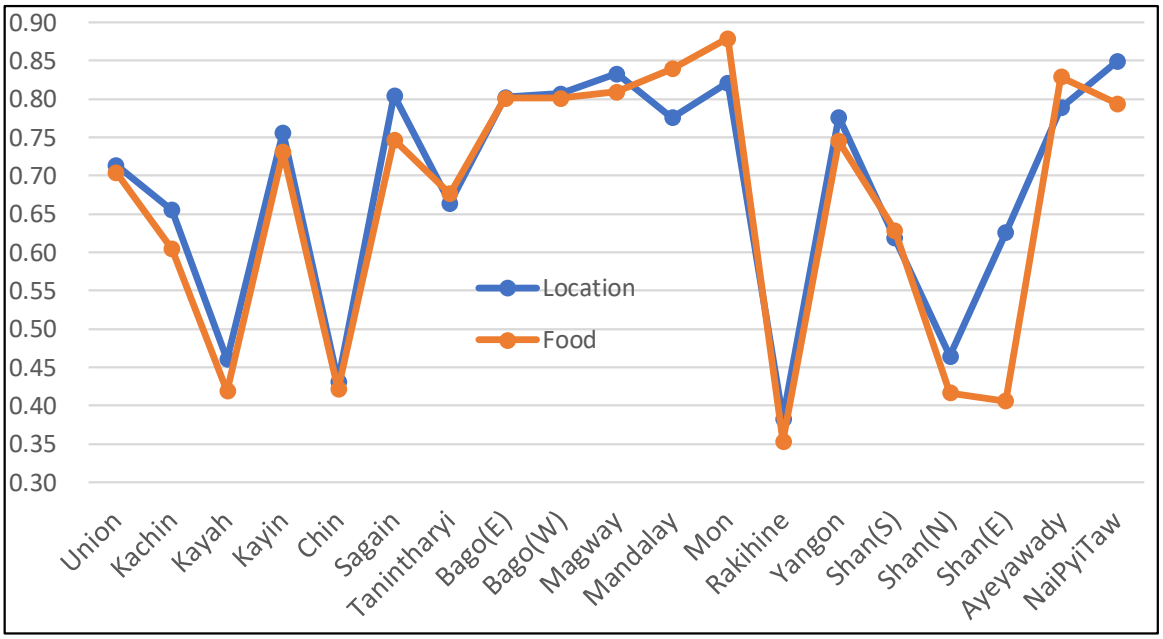

Figure 20. Location and Food Safety of Food Service Facilities and Snack Shops by State/Region

The values of these two indicators by state/region and by type of school were similarly distributed as seen in Figures 20 and 21. For example, 71.4% of schools nationwide answered that their school lunch facilities and snack shops were removed from the source of contamination (Y), but by state/region, 38.3% in Rakhine State, 43.2% in Chin State, 46.1% in Kayah State, 46.5% in Shan (East) State, etc. the ratios were remarkably low. The same was true for food safety.

Figure 21 shows a similar safety rating by school type. Overall, high schools were the safest, with the level of safety decreasing as the school type ranking decreased.

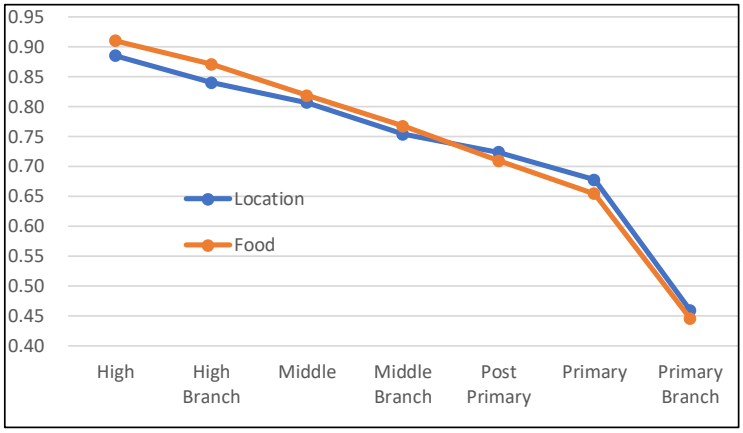

Figure 21. Location and Food Safety of School Lunch Facilities and Snack Shops by School Type

3.10.3 Toilet

Toilets are also important in improving the quality of school life. If there are no toilets at school, students have to relieve themselves in outdoors; and many reports have indicated that this hindered school attendance, especially for girls. In the 2019 school statistics, the number of toilets in each school was listed separately according to boys, girls, and shared use. For each of these, the number per 100 boy students, the number per 100 girl students, and the number per 100 boy and girl students were calculated. Then the numbers were summed to calculate the overall number per 100 students. This value was considered as the relative number of toilets independent of the number of students. Of course, school staff also use the toilets. However, in general, the number of school staff is smaller compared to the number of students and proportional to the number of students, so it was not considered to have a significant effect on the overall trend even without adding this value to the calculation.

The issue of two-shift schools must be taken into account, since two-shift schools can use up to twice as many facilities. Therefore, the nominal number of toilets per 100 students was calculated by doubling the number of toilets for schools with two-shift system. In addition, the distribution of this value was often zero. Since the distribution was skewed toward the high values, the 10th, 25th, 50th, 75th and 90th percentile values were calculated instead of calculating just the

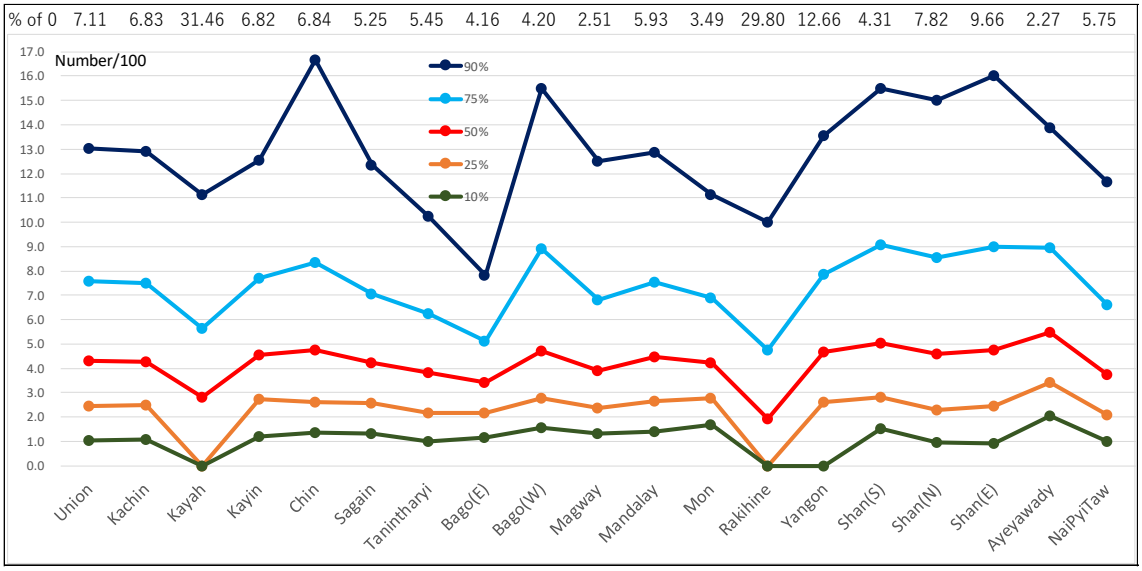

Figure 22. Availability of Toilets by State/Region (46,960 Schools Nationwide)

average value for the school group, and the percentage that was zero was also calculated separately for comparison.

Figure 22 shows the availability of toilets by state/region. The national average for the median (50th percentile) was 4.32, or 1 per 23.2 students, and the 25th percentile had a minimum of 2.47, or 1 per 40.5 students. However, 7.11% of the schools had no toilets at all. The percentage of schools with zero toilets was 31.46% in Kayah State and 29.80% in Rakhine State, which was extremely different from other states or regions.

Figure 23 shows a similar calculation for each school type. In high school, the median was 3.45, or 1

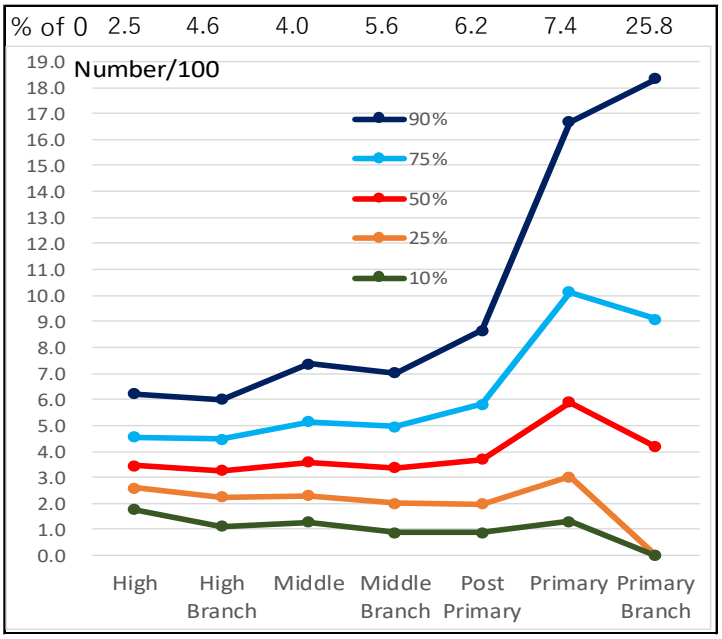

Figure 23. Status of Toilet Facilities by School Type

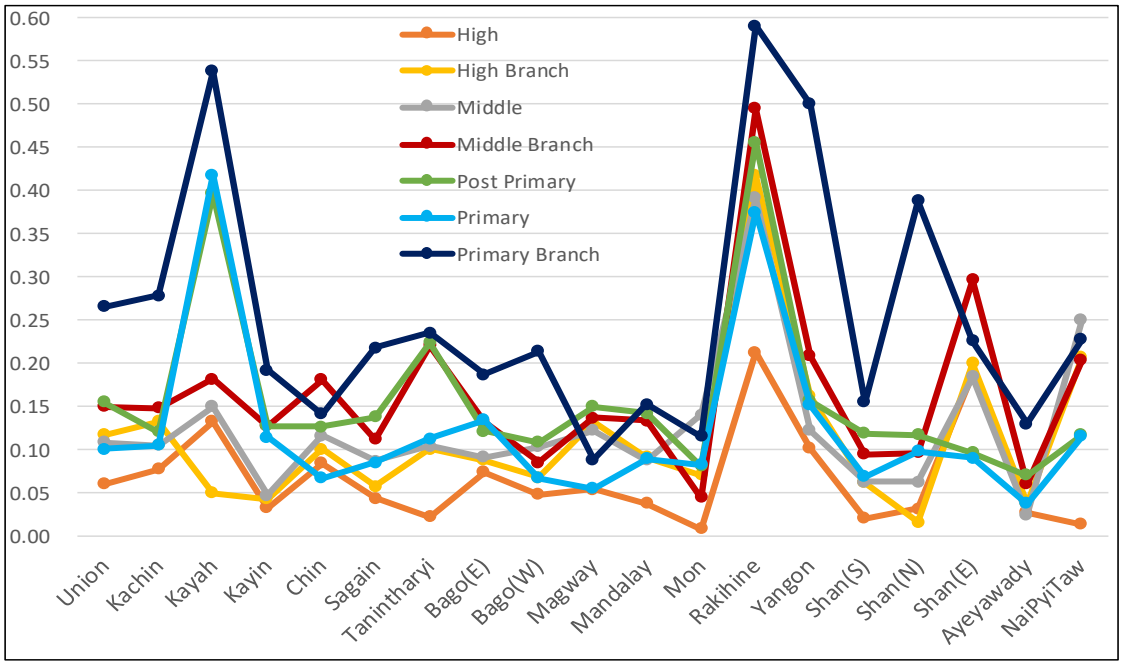

Figure 24. Percentage of Schools with a Substandard Number of Toilets by State/Region and by School Type

per 29.0 students. This value did not change much until post primary school, where it increased to 5.88 and 4.17 for primary and branch primary schools, respectively. This was because the number of toilets was calculated relatively high due to the small number of students, as shown in Figure 15, where 54.53% of the schools had less than 100 students. As can be seen from Figure 23, the variance was higher for lower school types and a higher percentage of schools with no toilets. The fact that 25.8% of branch primary schools, and even 2.5% of high schools, had no toilets at all was a significant problem.

According to Myanmar's school health regulations, there should be at least 1 toilet for every 75 students [11]. That means 1.33 toilets per 100 students is the minimum number of toilets, so it is possible to further process Figures 22 and 23 to obtain the percentage of schools with less than the standard number of toilets by state/region and school type. The percentage of schools with fewer than the standard number of toilets by state/region and school type can be determined.

Although the percentage was the lowest at high schools and the highest at branch primary schools for the country as a whole, the situation varied from state/region to state/region, as seen in Figure 24. The situation was much worse in Kayah and Rakhine States in general, but the type of schools that were worse was different. For the branch primary schools, 26.6% of schools nationwide, 59.0% of the schools in Rakhine State, and 53.8% of the schools in Kayah State had a substandard number of toilet facilities, but these were small schools with a small number of students.

Although the number of schools was large, the number of students who were inconvenienced in schools with a substandard number of toilets was smaller than the number of schools. The national average was 10.4%. However, in Rakhine, Kayah, and Shan (East) States, 39.5%, 19.4%, and 15.5%, respectively, showed that in some areas, a large number of students was inconvenienced in schools with a substandard number of toilets. There is much room for improvement; and it is urgently needed.

4. Conclusions and Policy Implications

4.1 Summary and Conclusion

The actual learning environment condition was clarified through an analysis of the facilities and equipment of basic education schools. As for library functions, 80.43% of schools had a library, 73.41% had cupboards/bookshelves, 83.10% had books, and 17.83% knew the specific size of the library area. Therefore, 16.90% of schools had no library function at all. Most of the schools which had a library appeared to have a library corner rather than a separate room. The larger the school size, the better the library function, and more than 90% of schools with 500 students had a library function, and about 50% of schools had a separate room. However, despite differences in school size, there was a large regional difference in library function, and the difference between the largest and the smallest States/Regions was about double.

If the school building area was not large enough to accommodate the number of students, the school had to adopt the two-shift system. Although only 1.89% of schools had a two-shift system nationally, the percentage was as high as 8.50% in high schools according to school category. In general, the larger the school size, the higher the ratio of schools with a two-shift system that ranged from about 10% for schools with 900 students to more than 30% for schools with more than 2,000 students. The quality of the school buildings was also an issue, as was the size of the school. 11.38% of schools nationwide had unsafe buildings, while the percentage was 32.97% in urban high schools. Old school buildings were found in historic schools. In 3.97% of the schools, more than 80% of the area of school buildings was at risk.

Although laboratories are indispensable for high-quality science education, only 3.23% of all schools had laboratories, and only 45.44% of high schools had laboratories. In urban areas, this percentage was 73.70% and 29.59% in rural areas and regional disparities were large. Since science experiments cannot be carried out without a laboratory, students are forced to rely on rote memorization. Even if a room called the "laboratory" exists, it is meaningless if the necessary facilities and equipment

for experiments are inadequate. Only 1.61% of the all basic education schools and 16.99% of the high schools had well-equipped laboratories. In urban areas, this ratio was 30.11%, and 9.64% in rural areas, and the disparity was large.

Electricity is necessary not only for lighting, but to run computers and other educational equipment as well. However, only 34.85% of all schools had electricity. The ratio was 77.87% in urban areas and 28.26% in rural areas. Since schools with electricity had a large number of students, the percentage of students with access to electricity was 60.11% in total, and 93.16% in urban areas, and 45.24% in rural areas, so the values were larger than the percentage calculated for each school. The availability of electricity in schools was absolutely dependent on the availability of electricity in the area where the school was located. For this reason, the use of electricity in rural area continues to lag behind urban areas; and there were large differences among States/Regions. Statistics showed that the use of electricity in schools was lower than households in many States/Regions, which may be problematic.

Due to the disruption caused by COVID-19, there is a lot of interest in distance education using computers and the internet. However, at the national level, more than 90% of the schools had no computers at all, and even 10.07% of the high schools in urban areas had no computers. In addition, only 3.59% of the schools in the country were capable of teaching computers, and only 56.70% of the high schools in urban areas and 26.08% of the high schools in rural areas were capable of teaching computers. The hardware was inadequate, but the teaching ability of teachers was also a major problem. Furthermore, only 1.84% of schools nationwide had access to the internet. This was 13.88% of high schools even in urban areas, and 5.70% in rural areas, which was extremely low. This signified that online education at home was not a realistic option at present.

In addition to the physical environment, the ability of teachers is as important as the learning environment for students. A new curriculum was successively introduced since the 2016 academic year. However, since the educational content and methods differed greatly from those of the past, it was important to provide adequate training for teachers in advance. As a result, many training activities have been implemented, but it was not clear whether all teachers, including teachers who were newly hired or had moved, received the necessary training when new academic year started. At the very least, the teachers in charge of the grade handling the new curriculum should have received training. However, many teachers as possible should receive training in the new curriculum, especially when the school scale was small and multiple grades were taught. As for KG, 10.50% of all primary school course teachers had not received training, and in branch primary schools this value was 42.20%. In G1, 8.50% of all primary school course teachers did not received training, and in branch primary schools this value was 37.32%. In G2, 5.35% of all primary school course teachers did not receive training, and in branch primary schools this value was 25.09%. In G3, 6.98% of all primary school course teachers did not receive training, and in branch primary schools this value was as high as 14.91%. In G6, 5.50% of all middle school course teachers did not receive training, and this value was as high as 8.66% in post primary schools. The ratio of relevant teachers who received training was higher for the new and most recently introduced curriculum, and although there were many schools where nearly all the teachers had received training, it was also true that no one received training in some schools. In response to this, in-service training was possible for schools with large scale and sufficient teachers, but in small-scale schools with two or three teachers, in-service training was difficult.

From the standpoint of whether the number of students per teacher (S/T ratio) was adequate, the S/T ratio improved to 20.21 for the primary school course, 26.17 for the middle school course, and 24.22 for the high school course. Since the S/T ratio was basically greatly influenced by the number of students, the ratio of each course was relatively large in urban areas and small in rural areas.

Under the slogan of "No one left behind," the Ministry of Education has been keen to promote the enrollment of students with disabilities. The percentage of schools with special facilities and equipment for

students with disabilities was 3.94% nationwide, higher in the urban areas than in rural schools, and a percentage of 9.48% in urban high schools. However, the percentage of schools that actually had students with some kind of disability was much higher at 14.72% nationwide and 31.57% in urban high schools. In schools with students with disabilities, the average number was 2.67, while in urban high schools it was 4.91. However, the percentage of students with disabilities in the total number of students in basic education schools was only 0.20%. The reason for this was that many of the handicapped children only attended school for a short period of time, and very few completed the high school course, since only a very small number of them pass the matriculation examination every year. Even in the primary school course, where there was a large number of schools where the proportion of students with disabilities within the total number of students was only 0.37%, According to the Inter Censal Survey conducted in 2019, about 3% of the school-age population were children with disabilities, and 1% had never been to school at all. This suggested that 2% points of children with disabilities may have received some schooling, even for a short period of time.

Among the various matters related to the learning environment, the water-related environment is directly related to the health of children, which is the basis of learning, and it is particularly desirable that the overall level of the water-rerated environment be high enough without any disparity, regardless of areas, types of school, or other conditions in which the children are placed. Although the various indicators are high on average, it is problematic that there are large differences among areas and types of schools. In particular, it is problematic that there are less than the standard number of toilets in some areas and types of school.

4.2 Policy Implications

The following policy implications can be derived from the above results.

1) It is necessary to expand the library function.

Libraries are important in helping students learn. It may be physically difficult to secure a room for a library in small schools, but it is possible to set up a library corner in the teacher's room or hallway. If there is a security problem, lockable cupboards will suffice. In addition to such facilities, if there are simple guidelines for the use of books, it will be easier for teachers to provide guidance and for children to use the library, which will help them learn more. The correction of regional disparities in educational services is emphasized in NESP2, but since there are large regional disparities in library functions, it is desirable to focus on the States/Regions that currently have low library functions and take measures to reduce the disparities.

2) Planned renovation of dangerous school buildings and expansion of classrooms are necessary.

School buildings have a limited lifespan, and more and more schools are reaching the end of their useful life every year. On the other hand, the number of students is increasing, which means that even dangerous school buildings have to be used. Over the long term, it will be necessary to add the necessary classrooms, but in reality, due to budget and construction period constraints, it will be necessary to create a long-term plan for the construction of school buildings, while considering the possibility of temporarily overcoming the shortage of school buildings by introducing a two-shift system.

3) There is an urgent need to improve the science laboratories.

In the current situation where science laboratories are not sufficiently equipped, the content of scientific experiments has to be memorized rather than experienced, which is considered to be a problem for learning effectiveness. The enhancement of science education is also emphasized in NESP2, and there is an urgent need to improve the current situation.

4) Efforts need to be made to increase the priority given to the availability of electricity in schools.

Electricity is necessary not only for lighting, but also for the use of computers and other educational equipment. Of course, if there is no electricity in the area where the school is located, there is nothing that can be done, but in many States/Regions, even if there is electricity in the neighborhood, there may not be electricity available in schools. It is necessary to think

of ways to increase the priority of electricity use in schools, such as strongly urging local governments.

5) ICT education needs to be enhanced.

Currently, both the number of computers, the use of the internet, and the ability of teachers to teach ICT are inadequate. Due to environmental changes caused by COVID-19, securing the possibility of on-line learning has become a crucial issue. Though it is a problem which takes time and budget, planning for the enhancement of ICT education, such as setting up pilot schools for ICT education in various places, will be necessary.

6) Continuing to focus on training on new curricula is necessary.

Many teachers have already received training through nationwide training on the new curriculum. However, it is also true that there are some schools that do not have any teacher who has received training, especially small-scale schools such as branch primary schools. This is probably because there are many newly recruited teachers in small-scale schools. Even if a teacher takes a class on teaching methods for a new curriculum at teachers' college, it would not be easy to teach a new curriculum without the guidance of senior teachers. If a school is somewhat large and has senior teachers who have received training, it will be possible to deal with it through in-school training. However, since there is no teacher who can teach at a small-scale school, in-school training is not possible. It is necessary to strengthen the system of school clusters that combine schools in the neighborhood, and to enhance the system to conduct necessary training within local communities, such as conducting lesson studies within school clusters.

7) It is necessary to prepare measures to promote the enrollment of students with disabilities.

It is good to know that students with disabilities seem to be accepted in many schools, but it is presumed that the number of years of their schooling may not be long. In addition to problems with the facilities and equipment of the schools where they are accepted, teachers also need adequate training in educational methods. In addition, special classes and special schools may be necessary for students with special needs. Enhancement of inclusive education for students with minor disabilities, development of special needs classes and schools according to the type and degree of students with disabilities, and teacher training on teaching methods for these students with disabilities will become increasingly necessary in the future. Without these specific measures, "No one left behind" may simply end up being just a slogan.

8) Regional disparities in water-related environment need to be corrected as soon as possible.

Regional disparities in the learning environment are not limited to the water-related environment. However, for example, the fact that there is a large disparity between areas and types of school in terms of the provision of toilets, with some areas and types of school having toilets that are less than the standard value, indicates that there is a large disparity in the environment related to children's health, which is the basis for learning, and urgent improvement is desirable.

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Abstract (Japanese)

ミャンマー連邦共和国基礎教育学校の学習環境について 2019 年度のデータを分析する事によって現状を明らかにすると共に，問題点と改善策を指摘した．

何らかの図書室機能がある学校は全国平均で 8 割以上であり，学校規模が大きくなればその割合も高くなる．児童生徒の増加に伴い教室不足が懸念されるが，一部では二部制によって校舎の活用を図っている．電気が通っていない学校が多く問題である．水の供給やトイレの整備など水関連の環境も全国的には比較的整備されているものの，地域や学校種別によっては整備が遅れている事は早急な対応が必要である．

物理的な学習環境の他に教員の能力向上も必要である．新カリキュラムに関する研修が全国的に実施され大きな成果を上げたが，小規模校を中心に研修を受けた教員が全くいない学校もある．障害児の就学も多くの学校で見られるものの，その就学数から推定するに，多くの障害児の就学が短期間に留まっているのではないかと危惧される．

Key words (Japanese)：学習環境，図書室機能，ICT，教授能力，障害児教育

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