Indicator　4.1.1

Indicator Name, Target and Goal

Indicator 4.1.1　Proportion of children and young people (a) in Grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

Target 4.1　By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

Goal 4　Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Definition and Rationale

○　Definition

This indicator is defined as the percentage of children and young people who have achieved a minimum proficiency level in mathematics in 4^{th} and 8^{th} grade.

○　Concepts

In the Trends in International Mathematics and Science Study (TIMSS), a score of 400 is considered the benchmark for achieving the “minimum proficiency level.”

The 400 points in the TIMSS is the international benchmark derived from the statistical processing of international survey data based on the standard deviation (100 points) of an average score (500) obtained by IRT; it does not perfectly match the National Curriculum Standard, which is the curriculum standard decided by MEXT for primary and secondary education levels. However, since TIMSS 2003, from which the idea for the international benchmark was derived, Japan has continued to maintain a very high level of the percentage of students achieving the 400-point line. This is an indication that equal opportunity of education exceeding a certain level has been realized in Japan. Since this is believed to be close to the nationwide situation for persons completing compulsory education, it is reasonable to interpret the “percentage of children and young people achieving the minimum proficiency level” as determined by this indicator as useful reference.

○ Rationale and Interpretation

The indicator measures the minimum learning outcomes necessary at a particular point in time of educational stage.

A high value indicates that more children and young people take part in quality primary and secondary education that produces appropriate and effective learning outcomes.

Regarding the point of the above-mentioned minimum learning outcomes, as mentioned in the “Concepts” section, the indicator does not perfectly match the National Curriculum Standard, which is the curriculum standard for the stages of primary and secondary education determined by MEXT. However, since TIMSS 2003, from which the idea for the international benchmark was derived, Japan has continued to maintain a very high level of the percentage of students achieving the 400-point line. This is an indication that equal opportunity of education exceeding a certain level has been realized in Japan. Since this is believed to be close to the nationwide situation for persons completing compulsory education, it is reasonable to interpret the “percentage of children and young people achieving the minimum proficiency level” as determined by this indicator as useful reference.

Data Sources and Collection Method

The TIMSS targets measure by an international scale the education achievements in arithmetic, mathematics, and science of students at the primary and secondary levels of education, and they are clearly related to various factors, including the conditions of students’ learning environments.

The survey targets are internationally determined to be “students enrolled in the upper of the two adjacent grades that contained the largest proportion of 9-year-old students” and “students enrolled in the upper of the two adjacent grades that contained the largest proportion of 13-year-old students” at the end of the fiscal year when the survey is conducted. In other words, the TIMSS survey targets are “students in the grade that represented 4 years of formal schooling, counting from the first year of primary or elementary schooling” (fourth grade), and “students in the grade that represented 8 years of formal schooling, counting from the first year of primary or elementary schooling” (eighth grade), designations which are based on UNESCO’S International Standard Classification of Education (ISCED). In Japan, these are

equivalent to students in the fourth year of elementary school and the second year of junior high school respectively. TIMSS is a sampling survey, and it is conducted so as to gain a representative picture of the educational situation of children in all the participating countries in accordance with internationally determined guidelines.

In addition to the tests on arithmetic/mathematics and science, questionnaires to students, teachers, schools, and parents (elementary school) are also conducted.

Method of Computation and Other Methodological Considerations

○ Computation Method

In Japan, the calculation is done by dividing the number of students who obtain 400 points or above on the TIMSS arithmetic/mathematics tests by the total number of students participating in the TIMSS arithmetic/mathematics survey, and multiplying the figure by 100 (decimal points are rounded off). For the calculation of the number of students, numerical values that have been weighted are used.

The following definitional equations are used:

4^{th}-year elementary school students

$$\frac{\text{The weighted number of students obtaining 400 points or more in the arithmetic test}}{\text{The weighted total number of students participating in the survey}} \times 100$$

2^{nd}-year junior high school students

$$\frac{\text{The weighted number of students obtaining 400 points or more in the mathematics test}}{\text{The weighted total number of students participating in the survey}} \times 100$$

○ Comments and limitations

As mentioned above, the TIMSS is an international survey, and it is not based on Japan's National Curriculum Standard, the educational curriculum standards decided by MEXT for primary and secondary education.

Since the survey concerns arithmetic/mathematics and science, MEXT cannot report on data regarding reading comprehension.

In addition, since analysis is not conducted according to the results by gender in the TIMSS survey report for Japan, we cannot report on data by gender.

As mentioned in previous sections, TIMSS targets internationally fourth grade elementary school students and eighth grade junior high school students, and it has been pointed out by the UNESCO Institute for Statistics (UIS) that in the case the term of primary education is five years or more, the survey results for the fourth grade could be interpreted as the values for students “undergoing primary education (second or third grade students), and the survey results for the eighth grade could be interpreted as the values for students “at the completion of junior high school.”

Data Disaggregation

N/A

References

Regarding TIMSS, please refer to the following websites.

(IEA Website)

https://timssandpirls.bc.edu/

(NIER Website, which is a representative institution on TIMSS in Japan)

http://www.nier.go.jp/timss/index.html

Custodian Ministries of Data

Ministry of Education, Culture, Sports, Science and Technology

Custodian Ministries of Related Policies

Ministry of Education, Culture, Sports, Science and Technology

International Organizations

UNESCO Institute for Statistics (UNESCO-UIS)