IEA TIMSS 2019

SECTION 1.1: VARIABLES DERIVED FROM THE STUDENT CONTEXT DATA GRADE 4

TIMSS 2019 USER GUIDE FOR THE INTERNATIONAL DATABASE

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Derived Variable Name:	Variable Label:
ASDG05S	Number of Home Study Supports

International Report Exhibits

Exhibits 5.1–5.3: Home Resources for Learning

Procedure

Based on responses to the following questions in the Student Questionnaire:
SQG-05c,d: Do you have any of these things at your home?
"Your own room" (ASBG05C)
"Internet connection" (ASBG05D)
Response options: 1 = "Yes"
2 = "No"

Derive ASDG05S:
0 = "Neither Own Room nor Internet Connection" = IF (ASBG05C = 2 AND ASBG05D = 2)
1 = "Either Own Room or Internet Connection" = IF ((ASBG05C = 1 AND ASBG05D = 2) OR (ASBG05C = 2 AND ASBG05D = 1))
2 = "Both Own Room and Internet Connection" = IF (ASBG05C = 1 AND ASBG05D = 1)

Set ASDG05S to missing if either source variable is missing.

0 = "Neither Own Room nor Internet Connection"
1 = "Either Own Room or Internet Connection"
2 = "Both Own Room and Internet Connection"

Trend Comments

See ASDG05S in TIMSS 2015

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SECTION 1.3: VARIABLES DERIVED FROM THE TEACHER CONTEXT DATA GRADE 4

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Derived Variable Name:	Variable Label:
ATDMMEM	Teachers Majored in Education and Mathematics

International Report Exhibits

Exhibits 9.5: Teachers Majored in Education and Mathematics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQG-04: What is the highest level of formal education you have completed? (ATBG04)
Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>"
2 = "<Upper secondary education—ISCED Level 3>"
3 = "<Post-secondary, non-tertiary education—ISCED Level 4>"
4 = "<Short-cycle tertiary education—ISCED Level 5>"
5 = "Bachelor's or equivalent level—ISCED Level 6>"
6 = "Master's or equivalent level—ISCED Level 7>"
7 = "Doctor or equivalent level—ISCED Level 8>"
TQG-05Aa-Af: During your <post-secondary> education, what was your major or main area(s) of study?
"Education—Primary/Elementary" (ATBG05AA)
"Mathematics" (ATBG05AC)
Response options: 1 = "Yes"
2 = "No"
TQG-05Ba-Bd: If your major or main area of study was education, did you have a <specialization> in any of the following?
"Mathematics" (ATBG05BA)
Response options: 1 = "Yes"
2 = "No"

Derive ATDMMEM:
1 = "Major in primary education and mathematics" = IF (ATBG05AA = 1 AND (ATBG05AC = 1 OR ATBG05BA = 1))
2 = "Major in primary education but no mathematics" = IF (ATBG05AA = 1 AND ATBG05AC = 2 AND ATBG05BA = 2)
3 = "Major in mathematics but no primary education" = IF (ATBG05AA = 2 AND (ATBG05AC = 1 OR ATBG05BA = 1))
4 = "All other majors" = IF (ATBG05AA = 2 AND ATBG05AC = 2 AND ATBG05BA = 2)
5 = "No formal education beyond upper-secondary" = IF (ATBG04 = 1 OR 2)
Otherwise, set to missing.

1 = "Major in Primary Education and Major (or Specialization) in Mathematics"
2 = "Major in Primary Education but No Major (or Specialization) in Mathematics"
3 = "Major in Mathematics but No Major in Primary Education"
4 = "All Other Majors"
5 = "No Formal Education Beyond Upper-Secondary"

Trend Comments

See ATDM05 in TIMSS 2015

Derived Variable Name:	Variable Label:
ATDSMES	Teachers Majored in Education and Science

International Report Exhibits

Exhibit 9.6: Teachers Majored in Education and Science

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQG-04: What is the highest level of formal education you have completed? (ATBG04)
Response options: 1 = "Did not complete <Upper secondary education—ISCED Level 3>"
2 = "<Upper secondary education—ISCED Level 3>"
3 = "<Post-secondary, non-tertiary education—ISCED Level 4>"
4 = "<Short-cycle tertiary education—ISCED Level 5>"
5 = "Bachelor's or equivalent level—ISCED Level 6>"
6 = "Master's or equivalent level—ISCED Level 7>"
7 = "Doctor or equivalent level—ISCED Level 8>"
TQG-05Aa-Af: During your <post-secondary> education, what was your major or main area(s) of study?
"Education—Primary/Elementary" (ATBG05AA)
"Science" (ATBG05AD)
Response options: 1 = "Yes"
2 = "No"
TQG-05Ba-Bd: If your major or main area of study was education, did you have a <specialization> in any of the following?
"Science" (ATBG05BB)
Response options: 1 = "Yes"
2 = "No"

Derive ATDSMES:
1 = "Major in primary education and science" = IF (ATBG05AA = 1 AND (ATBG05AD = 1 OR ATBG05BB = 1))
2 = "Major in primary education but no science " = IF (ATBG05AA = 1 AND ATBG05AD = 2 AND ATBG05BB = 2)
3 = "Major in science but no primary education" = IF (ATBG05AA = 2 AND (ATBG05AD = 1 OR ATBG05BB = 1))
4 = "All other majors" = IF (ATBG05AA = 2 AND ATBG05AD = 2 AND ATBG05BB = 2)
5 = "No formal education beyond upper-secondary" = IF (ATBG04 = 1 OR 2)
Otherwise, set to missing.

1 = "Major in Primary Education and Major (or Specialization) in Science "
2 = "Major in Primary Education but No Major (or Specialization) in Science"
3 = "Major in Science but No Major in Primary Education"
4 = "All Other Majors"
5 = "No Formal Education Beyond Upper-Secondary"

Trend Comments

See ATDS05 in TIMSS 2015

Derived Variable Name:	Variable Label:
ATDMNUM	Percent of Students Taught Number Topics

International Report Exhibits

Exhibits 12.4–12.5: Percentages of Students Taught the TIMSS Mathematics Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQM-05Aa-Ag: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"Concepts of whole numbers, including place value and ordering" (ATBM05AA)
"Adding, subtracting, multiplying, and dividing with whole numbers" (ATBM05AB)
"Concepts of multiples and factors; odd and even numbers" (ATBM05AC)
"Number sentences (finding the missing number, representing problem situations with numbers sentences)" (ATBCM05AD)
"Number patterns (extending number patterns and finding missing terms)" (ATBM05AE)
"Concepts of fractions, including representing, comparing and ordering, adding and subtracting simple fractions" (ATBM05AF)
"Concepts of decimals, including place value and ordering, adding and subtracting with decimals" (ATBM05AG)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDMNUM:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDMNUM to missing if three or more source variables are missing.

Trend Comments

See ATDM06NU in TIMSS 2015. Modifications made to source variables in 2019.

Derived Variable Name:	Variable Label:
ATDMGEO	Percent of Students Taught Measurement and Geometry Topics

International Report Exhibits

Exhibits 12.4–12.5: Percentages of Students Taught the TIMSS Mathematics Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQM-05Ba-Bf: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"Solving problems involving length, including measuring and estimating" (ATBM05BA)
"Solving problems involving mass, volume, and time" (ATBM05BB)
"Finding and estimating perimeter, area, and volume" (ATBM05BC)
"Parallel and perpendicular lines" (ATBM05BD)
"Comparing and drawing angles" (ATBM05BE)
"Elementary properties of common geometric shapes" (ATBM05BF)
"Three-dimensional shapes, including relationships with their two-dimensional representations" (ATBM05BG)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDMGEO:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDMGEO to missing if three or more source variables are missing.

Trend Comments

See ATDM06GE in TIMSS 2015. Modifications made to source variables in 2019.

Derived Variable Name:	Variable Label:
ATDMDAT	Percent of Students Taught Data Topics

International Report Exhibits

Exhibits 12.4–12.5: Percentages of Students Taught the TIMSS Mathematics Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQM-05Ca-Cc: The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"Reading and interpreting data from tables, pictographs, bar graphs, line graphs, and pie charts" (ATBM05CA)
"Organizing and representing data to help answer questions" (ATBM05CB)
"Drawing conclusions from data displays" (ATBM05CC)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDMDAT:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDMDAT to missing if three or more source variables are missing.

Trend Comments

See ATDM06DT in TIMSS 2015. Modifications made to source variables in 2019.

Derived Variable Name:	Variable Label:
ATDSLIF	Percent of Students Taught Life Science Topics

International Report Exhibits

Exhibits 13.4–13.5: Percentages of Students Taught the TIMSS Science Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQS-04Aa-Ag: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"Physical and behavioral characteristics of living things and major groups of living things (e.g., mammals, birds, insects, flowering plants)" (ATBS04AA)
"Major body structures and their functions in humans, other animals, and plants" (ATBS04AB)
"Life cycles of common plants and animals (e.g., flowering plants, butterflies, frogs)" (ATBS04AC)
"Characteristics of plants and animals that are inherited" (ATBS04AD)
"Interactions between organisms and their environments (e.g., physical features and behaviors that help living things survive in their environments)" (ATBS04AE)
"Relationships in ecosystems (e.g., simple food chains, predator-prey relationships, competition)" (ATBS04AF)
"Human health (transmission and prevention of diseases, everyday behaviors that promote good health)" (ATBS04AG)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDSLIF:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDSLIF to missing if three or more source variables are missing.

Trend Comments

See ATDS05LI in TIMSS 2015. Modifications made to source variables in 2019.

Derived Variable Name:	Variable Label:
ATDSPHY	Percent of Students Taught Physical Science Topics

International Report Exhibits

Exhibits 13.4–13.5: Percentages of Students Taught the TIMSS Science Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQS-04Ba-BI: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"States of matter (solid, liquid, gas) and their properties (volume, shape)" (ATBS04BA)
"Classifying materials based on physical properties (e.g., weight/mass, volume, state of matter, conductivity of heat or electricity)" (ATBS04BB)
"Mixtures, including methods for separating a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)" (ATBS04BC)
"Properties of magnets (e.g., like poles repel and opposite poles attract, magnets can attract some objects)" (ATBS04BD)
"Physical changes in everyday life (e.g., changes of state, dissolving)" (ATBS04BE)
"Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)" (ATBS04BF)
"Common sources of energy (e.g., the Sun, wind, oil) and uses of energy (heating and cooling homes, providing light" (ATBS04BG)
"Light and sound in everyday life (e.g., shadows and reflections, vibrating objects make sound)"(ATBS04BH)
"Heat transfer (e.g., energy flows from a hot object to a colder object)" (ATBS04BI)
"Electricity and simple electrical circuits (e.g., a circuit must be complete to work correctly)" (ATBS04BJ)
"Forces that cause objects to move (e.g., gravity, pushing/pulling) or change their motion (e.g., friction)" (ATBS04BK)
"Simple machines (e.g., levers, pulleys, wheels, ramps) that help make motion easier" (ATBS04BL)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDSPHY:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDSPHY to missing if three or more source variables are missing.

Trend Comments

See ATDS05PH in TIMSS 2015. Modifications made to source variables in 2019.

Derived Variable Name:	Variable Label:
ATDSEAR	Percent of Students Taught Earth Science Topics

International Report Exhibits

Exhibits 13.4–13.5: Percentages of Students Taught the TIMSS Science Topics

Procedure

Based on responses to the following questions in the Teacher Questionnaire:
TQS-04Ca-CH: The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the <fourth grade>, please choose "Mostly taught before this year." If a topic was taught half this year but not yet completed, please choose "Mostly taught this year." If a topic is not in the curriculum, please choose "Not yet taught or just introduced."
"Physical makeup of Earth's surface (e.g., land and water in unequal proportions, sources of fresh and salt water)" (ATBS04CA)
"Earth's resources used in everyday life (e.g., water, wind, soil, forests, oil, natural gas, minerals)" (ATBS04CB)
"Changes in Earth's surface over time (e.g., mountain building, weathering, erosion)" (ATBS04CC)
"Fossils and what they can tell us about past conditions on Earth" (ATBS04CD)
"Weather and climate (e.g., daily, seasonal, and locational variations versus long term trends)" (ATBS04CE)
"Objects in the Solar System (the Sun, the Earth, the Moon, and other planets) and their movements" (ATBS04CF)
"Earth's motion and related patterns observed on Earth (e.g., day and night, seasons)" (ATBS04CG)
Response options: 1 = "Mostly taught before this year"
2 = "Mostly taught this year"
3 = "Not yet taught or just introduced"

Derive ATDSEAR:
Step 1: Compute average percent for each topic area:
For each variable, compute the percent of students whose teachers selected 1 = "Mostly taught before this year" OR 2 = "Mostly taught this year."
Step 2: Compute average percent for content domain:
Compute average across the topic area percentages from Step 1.

Set ATDSEAR to missing if three or more source variables are missing.

Trend Comments

See ATDS05ES in TIMSS 2015. Modifications made to source variables in 2019.

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SECTION 1.4: VARIABLES DERIVED FROM THE SCHOOL CONTEXT DATA GRADE 4

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Derived Variable Name:	Variable Label:
ACDGSBC	School Composition by Socioeconomic Background

International Report Exhibits

Exhibits 6.1–6.3: School Composition by Socioeconomic Background of the Student Body

Procedure

Based on responses to the following questions in the School Questionnaire:
ScQ-03: Approximately what percentage of students in your school have the following backgrounds?
"Come from economically disadvantaged homes" (ACBG03A)
"Come from economically affluent homes" (ACBG03B)
Response options: 1 = "0 to 10%"
2 = "11 to 25%"
3 = "26 to 50%"
4 = "More than 50%"

Derive ACDGSBC:
1 = "More Affluent" = IF (ACBG03A <=2 AND ACBG03B >= 3)
3 = "More Disadvantaged" = IF (ACBG03A >=3 AND ACBG03B <= 2)
2 = "Neither More Affluent nor More Disadvantaged" = IF (All other combinations of ACBG03A and ACBG03B)

Set ACDGSBC to missing if either source variable is missing.

1 = "More Affluent"
2 = "Neither More Affluent nor More Disadvantaged"
3 = "More Disadvantaged"

Trend Comments

See ACDG03 in TIMSS 2015

Derived Variable Name:	Variable Label:
ACDGTIHY	Total Instructional Hours per Year

International Report Exhibits

Exhibits 12.1–12.2: Instructional Time Spent on Mathematics

Exhibits 13.1–13.2: Instructional Time Spent on Science

Procedure

Based on responses to the following questions in the School Questionnaire:
ScQ-06A: How many days per year is your school open for instruction? (ACBG06A)
(Open-response item)
ScQ-06B: What is the total instructional time, excluding breaks, in a typical day? (ACBG06B)
(Open-response item; response in terms of minutes)

Derive ACDGTIHY:
Step 1: Compute instructional hours per day:
Divide ACBG06B by 60.
Step 2: Compute hours of school per year:
Multiply the result of Step 1 by ACBG06A.

Set ACDGTIHY to missing if either source variable is missing.

Trend Comments

See ACDG08HY in TIMSS 2015