TEDS-M

TEDS-M 2008 User Guide for the International Database

Supplement 3

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ISBN/EAN: 978-90-79549-11-5

Publisher: the IEA Secretariat

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The International Association for the Evaluation of Educational Achievement, known as IEA, is an independent, international consortium of national research institutions and government research agencies, with headquarters in Amsterdam. Its primary purpose is to conduct large-scale comparative studies of educational achievement with the aim of gaining more in-depth understanding of the effects of policies and practices within and across systems of education.

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SUPPLEMENT 3:

Variables Derived from the Educator and Future Teacher Data

Overview

This supplement contains documentation on all the derived variables contained in the TEDS-M educator and future teacher data files. These derived variables were used to report data in the TEDS-M international reports. The variables that constitute the scales and indices are made available as part of the TEDS-M International Database to be used in secondary analyses. This supplement has three sections:

- Section 1: Educator Questionnaire
- Section 2: Future Teacher Questionnaire (Parts B and D)
- Section 3: Future Teacher Knowledge Assessments (Part C)

In each section the variable name given to the derived variable is provided first, followed by the variable names of the variables used to construct the derived variable. The variables that were used to derive the indices and scales are presented in the order they appear in the instruments.

The following information is provided for each derived variable:

- Variable Name: The name of the derived variable
- Description: A description of the variable content or domain
- Procedure: A procedural description of how the derived variable was computed[1]
- Source: The source variables used to derive the scale or index

1 Details of the scaling processes are provided in the TEDS-M Technical Report (Tatto, forthcoming).

Section 1: Educator Questionnaire

Variable Name:	MEG2APRA	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Assessment Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected, how often do you give your <future teachers> the opportunity to do the following?	
	MEG002A	Analyze and use national or state standards or frameworks for school mathematics
	MEG002B	Build on pupils' existing mathematics knowledge and thinking skills
	MEI003B	Analyze pupil assessment data to learn how to assess more effectively
	MEI003C	Assess higher-level goals (e.g. problem-solving, critical thinking)
	MEI003D	Assess low-level objectives (factual knowledge, routine procedures and so forth)

Variable Name:	MEG2IPRA	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Instructional Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source: the	In the <course> you selected, how often do you give your <future teachers> the opportunity to do following?	
	MEG002C	Explore how to apply mathematics to real-world problems
	MEG002E	Explore mathematics as the source for real-world problems
	MEG002F	Learn how to explore multiple solution strategies with pupils
	MEG002G	Learn how to show why a mathematics procedure works
	MEG002H	Make distinctions between procedural and conceptual knowledge when teaching mathematics concepts and operations to pupils
	MEG002I	Integrate mathematical ideas from across areas of mathematics

Variable Name:	MEH1IMPR	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Improving Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected above, how often do you give your <future teachers> the opportunity to do the following?	
	MEH001E	Develop and test new teaching practices
	MEH001F	Set appropriately challenging learning expectations for pupils
	MEH001G	Learn how to use findings from research to improve knowledge and practice
	MEH001H	Connect learning across subject areas
	MEH001I	Study ethical standards and codes of conduct expected of teachers
	MEH001J	Create methods to enhance pupils' confidence and self-esteem
	MEH001K	Identify opportunities for changing existing schooling practices
	MEH001L	Identify appropriate resources needed for teaching

Variable Name:	MEH2DVRS	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Diversity	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In this <course> how often do you give your <future teachers> the opportunity to learn to do the following?	
	MEH002A	Develop specific strategies for teaching students with behavioral and emotional problems
	MEH002B	Develop specific strategies and curriculum for teaching pupils with learning disabilities
	MEH002C	Develop specific strategies and curriculum for teaching gifted pupils
	MEH002D	Develop specific strategies and curriculum for teaching pupils from diverse cultural backgrounds
	MEH002E	Accommodate the needs of pupils with physical disabilities in their classroom
	MEH002F	Work with children from poor or disadvantaged backgrounds

Variable Name:	MEH2REFL	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Reflection on Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In this <course> how often do you give your <future teachers> the opportunity to learn to do the following?	
	MEH002G	Use teaching standards and codes of conduct to reflect on their teaching
	MEH002H	Develop strategies to reflect upon the effectiveness of their teaching
	MEH002I	Develop strategies to reflect upon their professional knowledge
	MEH002J	Develop strategies to identify their learning needs

Variable Name:	MEI1PART	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Class Participation	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected above, to what extent are your <future teachers> expected to do each of the following?	
	MEI001B	Ask questions during class time
	MEI001C	Participate in a whole class discussion
	MEI001D	Make presentations to the rest of the class
	MEI001E	Teach a class session using methods chosen by the <future teacher>
	MEI001F	Teach a class session using methods demonstrated by the instructor

Variable Name:	MEI1READ	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Class Reading	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected above, to what extent are your <future teachers> expected to do each of the following?	
	MEI001H	Read about research on mathematics
	MEI001I	Read about research on mathematics education
	MEI001J	Read about research on teaching and learning
	MEI001K	Analyze examples of teaching (e.g., film, video, transcript of lesson)

Variable Name:	MEI5SOLV	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Solving Problems	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected above, to what extent are your <future teachers> expected to do each of the following?	
	MEI001L	Write mathematical proofs
	MEI001M	Solve problems in applied mathematics
	MEI001N	Solve a given mathematics problem using multiple strategies
	MEI001O	Use computers or calculators to solve mathematics problems

Variable Name:	MEI2CLP	
Description:	OPPORTUNITIES TO LEARN (OTL) – School Experience - Connecting Classroom Learning to Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	During the <course> you selected earlier, how often do you require your <future teachers> to do each of the following?	
	MEI002A	Observe models of the teaching strategies they are learning
	MEI002B	Practice theories for teaching subject-matter content they are learning
	MEI002C	Complete assessment tasks that show how they had applied ideas they are learning
	MEI002D	Receive feedback about how well they had implemented teaching strategies they are learning
	MEI002E	Collect and analyze evidence about pupil learning as a result of their teaching methods
	MEI002F	Test out findings from educational research about difficulties pupils have in learning
	MEI002G	Develop strategies to reflect upon their professional knowledge
	MEI002H	Demonstrate that they can apply the teaching methods they are learning

Variable Name:	MEI3AUSE	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Assessment Uses	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected, how often do you give your <future teachers> the opportunity to do the following?	
	MEI003J	Give useful and timely feedback to pupils about their learning
	MEI003K	Help pupils learn how to assess their own learning
	MEI003M	Use assessment to give effective feedback to parents or guardians
	MEI003N	Use assessment to give feedback to pupils about their learning
	MEI003O	Use classroom assessments to guide your decisions about what and how to teach

Variable Name:	MEI3IPLA	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Instructional Planning	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the <course> you selected, how often do you give your <future teachers> the opportunity to do the following?	
	MEI003A	Accommodate a wide range of abilities in each lesson
	MEI003E	Create learning experiences that make the central concepts of subject matter meaningful to pupils
	MEI003F	Create projects that motivate all pupils to participate
	MEI003G	Deal with learning difficulties so that specific pupil outcomes are accomplished
	MEI003H	Develop games or puzzles that provide instructional activities at a high interest level
	MEI003I	Develop instructional materials that build on pupils' experiences, interests and abilities
	MEI003P	Use pupils' misconceptions to plan instruction

Variable Name:	MEJ1COH	
Description:	OPPORTUNITIES TO LEARN (OTL) – Program Coherence	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider all of the <courses> in the program including subject matter <courses> (e.g. mathematics), mathematics <pedagogy courses>, and general education <pedagogy> <courses>. Please indicate the extent to which you agree or disagree with the following statements.	
	MEJ001A	Each stage of the program seemed to be planned to meet the main needs <future teachers> had at each stage of their preparation
	MEJ001B	Later <courses> in the program build on what is taught in earlier <courses> in the program
	MEJ001C	The program was organized in a way that covered what <future teachers> needed to learn to become effective teachers
	MEJ001D	The <courses> seemed to follow a logical sequence of development in terms of content and topics
	MEJ001E	Each of the <courses> was clearly designed to prepare <future teachers> to meet a common set of explicit standard expectations for beginning teachers
	MEJ001F	There were clear links between most of the <courses> in the teacher education program

Variable Name:	MEK1RULE	
Description:	BELIEFS ABOUT THE NATURE OF MATHEMATICS - Rules and Procedures	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree disagree with the following beliefs about the nature of mathematics?	
	MEK001A	Mathematics is a collection of rules and procedures that prescribe how to solve a problem
	MEK001B	Mathematics involves the remembering and application of definitions, formulas, mathematical facts and procedures.
	MEK001E	When solving mathematical tasks you need to know the correct procedure else you would be lost
	MEK001G	Fundamental to mathematics is its logical rigor and preciseness.
	MEK001K	To do mathematics requires much practice, correct application of routines, and problem solving strategies
	MEK001L	Mathematics means learning, remembering and applying

Variable Name:	MEK1PROC	
Description:	BELIEFS ABOUT THE NATURE OF MATHEMATICS - Process of Inquiry	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree disagree with the following beliefs about the nature of mathematics?	
	MEK001C	Mathematics involves creativity and new ideas
	MEK001D	In mathematics many things can be discovered and tried out by oneself
	MEK001F	If you engage in mathematical tasks, you can discover new things (e.g., connections, rules, concepts)
	MEK001H	Mathematical problems can be solved correctly in many ways
	MEK001I	Many aspects of mathematics have practical relevance
	MEK001J	Mathematics helps solve everyday problems and tasks

Variable Name:	MEK2TEAC	
Description:	BELIEFS ABOUT LEARNING MATHEMATICS - Teacher Direction	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	From your perspective, to what extent would you agree or disagree with each of the following statements about learning mathematics?	
	MEK002A	The best way to do well in mathematics is to memorize all the formulas
	MEK002B	Pupils need to be taught exact procedures for solving mathematical problems
	MEK002C	It doesn't really matter if you understand a mathematical problem, if you can get the right answer
	MEK002D	To be good in mathematics you must be able to solve problems quickly
	MEK002E	Pupils learn mathematics best by attending to the teacher's explanations
	MEK002F	When pupils are working on mathematical problems, more emphasis should be put on getting the correct answer than on the process followed
	MEK002I	Non-standard procedures should be discouraged because they can interfere with learning the correct procedure
	MEK002J	Hands-on mathematics experiences aren't worth the time and expense

Variable Name:	MEK2ACTV	
Description:	BELIEFS ABOUT LEARNING MATHEMATICS - Active Learning	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	From your perspective, to what extent would you agree or disagree with each of the following statements about learning mathematics?	
	MEK002G	In addition to getting a right answer in mathematics, it is important to understand why the answer is correct
	MEK002H	Teachers should allow pupils to figure out their own ways to solve mathematical problems
	MEK002K	Time used to investigate why a solution to a mathematical problem works is time well spent
	MEK002L	Pupils can figure out a way to solve mathematical problems without a teacher's help
	MEK002M	Teachers should encourage pupils to find their own solutions to mathematical problems even if they are inefficient
	MEK002N	It is helpful for pupils to discuss different ways to solve particular problems

Variable Name:	MEK3FIXD	
Description:	BELIEFS ABOUT MATHEMATICS ACHIEVEMENT - Fixed Ability	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with each of the following statements about pupil achievement in <primary/lower secondary> mathematics?	
	MEK003A	Since older pupils can reason abstractly, the use of hands-on models and other visual aids becomes less necessary
	MEK003B	To be good at mathematics you need to have a kind of "mathematical mind"
	MEK003C	Mathematics is a subject in which natural ability matters a lot more than effort
	MEK003D	Only the more able pupils can participate in multi-step problem solving activities
	MEK003E	In general, boys tend to be naturally better at mathematics than girls
	MEK003F	Mathematical ability is something that remains relatively fixed throughout a person's life
	MEK003G	Some people are good at mathematics and some aren't
	MEK003H	Some ethnic groups are better at mathematics than others

Variable Name:	MEL1PREP	
Description:	BELIEFS ABOUT THE PROGRAM AS A WHOLE - Preparedness for Teaching Mathematics	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Please indicate the extent to which you think the teacher education program has prepared <future teachers> to do the following when they start their teaching career.	
	MEL001A	Communicate ideas and information about mathematics clearly to pupils
	MEL001B	Establish appropriate learning goals in mathematics for pupils
	MEL001C	Set up mathematics learning activities to help pupils achieve learning goals
	MEL001D	Use questions to promote higher order thinking in mathematics
	MEL001E	Use computers and ICT to aid in teaching mathematics
	MEL001F	Challenge pupils to engage in critical thinking about mathematics
	MEL001G	Establish a supportive environment for learning mathematics
	MEL001H	Use assessment to give effective feedback to pupils about their mathematics learning
	MEL001I	Provide parents with useful information about pupils' progress in mathematics
	MEL001J	Develop assessment tasks that promote learning in mathematics
	MEL001K	Incorporate effective classroom management strategies into mathematics teaching
	MEL001L	Have a positive influence on difficult or unmotivated pupils
	MEL001M	Work collaboratively with other teachers

Section 2: Future Teacher Questionnaires (Parts B and D)[2]

Variable Name:	MFB1GEOM	
Description:	OPPORTUNITIES TO LEARN (OTL) – Tertiary Level Math - Geometry	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in university level mathematics. Please indicate whether you have ever studied each topic.	
	MFB001A	Foundations of Geometry or Axiomatic Geometry (e.g., Euclidean axioms)
	MFB001B	Analytic/Coordinate Geometry (e.g., equations of lines, curves, conic sections, rigid transformations or isometrics)
	MFB001C	Non-Euclidean Geometry (e.g., geometry on a sphere)
	MFB001D	Differential Geometry (e.g., sets that are manifolds, curvature of curves, and surfaces)

Variable Name:	MFB1DISC	
Description:	OPPORTUNITIES TO LEARN (OTL) – Tertiary Level Math - Discrete Structures & Logic	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in university level mathematics. Please indicate whether you have ever studied each topic.	
	MFB001F	Linear Algebra (e.g., vector spaces, matrices, dimensions, eigenvalues, eigenvectors)
	MFB001G	Set Theory
	MFB001H	Abstract Algebra (e.g., group theory, field theory, ring theory, ideals)
	MFB001I	Number Theory (e.g., divisibility, prime numbers, structuring integers)
	MFB001P	Discrete Mathematics, Graph theory, Game theory, Combinatorics or Boolean Algebra
	MFB001S	Mathematical Logic (e.g., truth tables, symbolic logic, propositional logic, set theory, binary operations)

Variable Name:	MFB1CONT	
Description:	OPPORTUNITIES TO LEARN (OTL) – Tertiary Level Math - Continuity & Functions	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in university level mathematics. Please indicate whether you have ever studied each topic.	
	MFB001J	Beginning Calculus Topics (e.g., limits, series, sequences)
	MFB001K	Calculus (e.g., derivatives and integrals)
	MFB001L	Multivariate Calculus (e.g., partial derivatives, multiple integrals)
	MFB001M	Advanced Calculus or Real Analysis or Measure Theory
	MFB001N	Differential Equations (e.g., ordinary, differential equations and partial differential equations)

2 The future primary and lower-secondary teacher questionnaires contained the same questions in parts B and D.

Variable Name:	MFB1PRST	
Description:	OPPORTUNITIES TO LEARN (OTL) – Tertiary Level Math - Probability & Statistics	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in university level mathematics. Please indicate whether you have ever studied each topic.	
	MFB001Q	Probability
	MFB001R	Theoretical or Applied Statistics

Variable Name:	MFB2SLMN	
Description:	OPPORTUNITIES TO LEARN (OTL) – School Level Math - Numbers Measurement Geometry	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following list of mathematics topics that are often taught at the <primary> or <secondary> school level. Please indicate whether you have studied each topic as part of your current teacher preparation program.	
	MFB002A	Numbers (e.g., whole numbers, fractions, decimals, integer, rational, and real numbers; number concepts; number theory; estimation; ratio and proportionality)
	MFB002B	Measurement (e.g., measurement units; computations and properties of length, perimeter, area, and volume; estimation and error)
	MFB002C	Geometry (e.g., 1-D and 2-D coordinate geometry, Euclidean geometry, transformational geometry, congruence and similarity, constructions with straightedge and compass, 3-D geometry, vector geometry)

Variable Name:	MFB2SLMF	
Description:	OPPORTUNITIES TO LEARN (OTL) – School Level Math - Functions Probability Calculus	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following list of mathematics topics that are often taught at the <primary> or<secondary> school level. Please indicate whether you have studied each topic as part of your current teacher preparation program.	
	MFB002D	Functions, Relations, and Equations (e.g., algebra, trigonometry, analytic geometry)
	MFB002E	Data Representation, Probability, and Statistics
	MFB002F	Calculus (e.g., infinite processes, change, differentiation, integration)
	MFB002G	Validation, Structuring, and Abstracting (e.g., Boolean algebra, mathematical induction, logical connectives, sets, groups, fields, linear space, isomorphism, homomorphism)

Variable Name:	MFB4FOUN	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Education Pedagogy - Foundations	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following list of mathematics education/<pedagogy> topics. Please indicate whether you have studied each topic as p art of your current teacher preparation program.	
	MFB004A	Foundations of Mathematics (e.g., mathematics and philosophy, mathematics epistemology, history of mathematics)
	MFB004B	Context of Mathematics Education (e.g., role of mathematics in society, gender/ ethnic aspects of mathematics achievement)
	MFB004C	Development of Mathematics Ability and Thinking (e.g., theories of mathematics ability and thinking; developing mathematical concepts; reasoning, argumentation, and proving; abstracting and generalizing; carrying out procedures and algorithms; application; modeling)

Variable Name:	MFB4INST	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Education Pedagogy - Instruction	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following list of mathematics education/<pedagogy> topics. Please indicate whether you have studied each topic as part of your current teacher preparation program.	
	MFB004D	Mathematics Instruction (e.g., representation of mathematics content and concepts, teaching methods, analysis of mathematical problems and solutions, problem posing strategies, teacher-pupil interaction)
	MFB004E	Developing Teaching Plans (e.g., selection and sequencing the mathematics content, studying and selecting textbooks and instructional materials)
	MFB004F	Mathematics Teaching: Observation, Analysis and Reflection
	MFB004G	Mathematics Standards and Curriculum
	MFB004H	Affective Issues in Mathematics (e.g., beliefs, attitudes, mathematics anxiety)

Variable Name:	MFB5PART	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Class Participation	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In the mathematics education<pedagogy/teaching methods> courses that you have taken or are currently taking in your teacher preparation program, how frequently did you do any of the following?	
	MFB005B	Ask questions during class time
	MFB005C	Participate in a whole class discussion
	MFB005D	Make presentations to the rest of the class
	MFB005E	Teach a class session using methods of my own choice
	MFB005F	Teach a class session using methods demonstrated by the instructor

Variable Name:	MFB5READ
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Class Reading
Procedure:	Rasch score scale where 10 is located at the neutral position
Source:	In the mathematics education<pedagogy/teaching methods> courses that you have taken or are currently taking in your teacher preparation program, how frequently did you do any of the following? MFB005H Read about research on mathematics MFB005I Read about research on mathematics education MFB005J Read about research on teaching and learning MFB005K Analyze examples of teaching (e.g., film, video, transcript of lesson)

Variable Name:	MFB5SOLV
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Solving Problems
Procedure:	Rasch score scale where 10 is located at the neutral position
Source:	In the mathematics education<pedagogy/teaching methods> courses that you have taken or are currently taking in your teacher preparation program, how frequently did you do any of the following? MFB005L Write mathematical proofs MFB005M Solve problems in applied mathematics MFB005N Solve a given mathematics problem using multiple strategies MFB005O Use computers or calculators to solve mathematics problems

Variable Name:	MFB6IPRA
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Instructional Practice
Procedure:	Rasch score scale where 10 is located at the neutral position
Source:	In your current teacher preparation program, how frequently did you engage in activities that gave you the opportunity to learn how to do the following? MFB006L Explore how to apply mathematics to real-world problems MFB006N Explore mathematics as the source for real-world problems MFB006Q Learn how to explore multiple solution strategies with pupils MFB006R Learn how to show why a mathematics procedure works MFB006T Make distinctions between procedural and conceptual knowledge when teaching mathematics concepts and operations to pupils MFB006Z Integrate mathematical ideas from across areas of mathematics

Variable Name:	MFB6IPLA	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Instructional Planning	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your current teacher preparation program, how frequently did you engage in activities that gave you the opportunity to learn how to do the following?	
	MFB006A	Accommodate a wide range of abilities in each lesson
	MFB006G	Create learning experiences that make the central concepts of subject matter meaningful to pupils
	MFB006H	Create projects that motivate all pupil s to participate
	MFB006I	Deal with learning difficulties so that specific pupil outcomes are accomplished
	MFB006J	Develop games or puzzles that provide instructional activities at a high interest level
	MFB006K	Develop instructional materials that build on pupils' experiences, interests and abilities
	MFB006X	Use pupils' misconceptions to plan instruction

Variable Name:	MFB6AUSE	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Assessment Uses	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your current teacher preparation program, how frequently did you engage in activities that gave you the opportunity to learn how to do the following?	
	MFB006O	Give useful and timely feedback to pupils about their learning
	MFB006P	Help pupils learn how to assess their own learning
	MFB006U	Use assessment to give effective feedback to parents or guardians
	MFB006V	Use assessment to give feedback to pupils about their learning
	MFB006W	Use classroom assessments to guide your decisions about what and how to teach

Variable Name:	MFB6APRA	
Description:	OPPORTUNITIES TO LEARN (OTL) – Math Ed Pedagogy - Assessment Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your current teacher preparation program, how frequently did you engage in activities that gave you the opportunity to learn how to do the following?	
	MFB006B	Analyze and use national or state standards or frameworks for school mathematics
	MFB006C	Analyze pupil assessment data to learn how to assess more effectively
	MFB006D	Assess higher–level goals (e.g., problem-solving, critical thinking)
	MFB006E	Assess low–level objectives (factual knowledge, routine procedures and so forth)
	MFB006F	Build on pupils' existing mathematics knowledge and thinking skills

Variable Name:	MFB7EPSS	
Description:	OPPORTUNITIES TO LEARN (OTL) – Education Pedagogy - Social Science	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in education and <pedagogy>. Please indicate whether you have studied each topic as part of your current teacher preparation program.	
	MFB007A	History of Education and Educational Systems (e.g., historical development of the national system, development of international systems)
	MFB007B	Philosophy of Education (e.g., ethics, values, theory of knowledge, legal issues)
	MFB007C	Sociology of Education (e.g., purpose and function of education in society, organization of current educational systems, education and social conditions, diversity, educational reform)

Variable Name:	MFB7EPAP	
Description:	OPPORTUNITIES TO LEARN (OTL) – Education Pedagogy - Application	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider the following topics in education and <pedagogy>. Please indicate whether you have studied each topic as part of your current teacher preparation pr4ogram	
	MFB007D	Educational Psychology (e.g., motivational theory, child development, learning theory)
	MFB007E	Theories of Schooling (e.g., goals of schooling, teacher's role, curriculum theory and development, didactic/teaching models, teacher-pupil relations, school administration and leadership)
	MFB007F	Methods of Educational Research (e.g., read, interpret and use education research; theory and practice of action research)
	MFB007G	Assessment and Measurement: Theory and Practice
	MFB007H	Knowledge of Teaching (e.g., knowing how to teach pupils of different backgrounds, use resources to support instruction, manage classrooms, communicate with parents)

Variable Name:	MFB8DVRS	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Diversity	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your teacher preparation program, how often did you have the opportunity to learn to do the following?	
	MFB008A	Develop specific strategies for teaching students with behavioral and emotional problems
	MFB008B	Develop specific strategies and curriculum for teaching pupils with learning disabilities
	MFB008C	Develop specific strategies and curriculum for teaching gifted pupils
	MFB008D	Develop specific strategies and curriculum for teaching pupils from diverse cultural backgrounds
	MFB008E	Accommodate the needs of pupils with physical disabilities in your classroom
	MFB008F	Work with children from poor or disadvantaged backgrounds

Variable Name:	MFB8REFL	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Reflection on Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your teacher preparation program, how often did you have the opportunity to learn to do the following?	
	MFB008G	Use teaching standards and codes of conduct to reflect on your teaching
	MFB008H	Develop strategies to reflect upon the effectiveness of your teaching
	MFB008I	Develop strategies to reflect upon your professional knowledge
	MFB008J	Develop strategies to identify your learning needs

Variable Name:	MFB9IMPR	
Description:	OPPORTUNITIES TO LEARN (OTL) – Teaching for Improving Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	In your teacher preparation program, how often did you have the opportunity to learn to do the following?	
	MFB009E	Develop and test new teaching practices
	MFB009F	Set appropriately challenging learning expectations for pupils
	MFB009G	Learn how to use findings from research to improve knowledge and practice
	MFB009H	Connect learning across subject areas
	MFB009I	Study ethical standards and codes of conduct expected of teachers
	MFB009J	Create methods to enhance pupils' confidence and self-esteem
	MFB009K	Identify opportunities for changing existing schooling practices
	MFB009L	Identify appropriate resources needed for teaching

Variable Name:	MFB13CLP	
Description:	OPPORTUNITIES TO LEARN (OTL) – School Experience - Connecting Classroom Learning to Practice	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	During the school experience part of your program, how often were you required to do each of the following?	
	MFB013A	Observe models of the teaching strategies you were learning in your <courses>
	MFB013B	Practice theories for teaching mathematics that you were learning in your <courses>
	MFB013C	Complete assessment tasks that asked you to show how you were applying ideas you were learning in your <courses>
	MFB013D	Receive feedback about how well you had implemented teaching strategies you were learning in your <courses>
	MFB013E	Collect and analyze evidence about pupil learning as a result of your teaching methods
	MFB013F	Test out findings from educational research about difficulties pupils have in learning in your <courses>
	MFB013G	Develop strategies to reflect upon your professional knowledge
	MFB013H	Demonstrate that you could apply the teaching methods you were learning in your <courses>

Variable Name:	MFB14STR	
Description:	OPPORTUNITIES TO LEARN (OTL) – Supervising Teacher Reinforcement of University Goals for Practicum	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with the following statements about the <field experience and/or practicum> you had in your teacher preparation program?	
	MFB014A	I had a clear understanding of what my school-based <supervising teacher/mentor/ instructors> expected of me as a teacher in order to pass the <field experiences/ practicum>
	MFB014B	My school-based <supervising teacher/mentor/instructors> valued the ideas and approaches I brought from my <university/college> teacher education program
	MFB014C	My school-based < supervising teacher/mentor/instructors > used criteria/ standards provided by my <university/college> when reviewing my lessons with me
	MFB014D	I learned the same criteria or standards for good teaching in my <courses> and in my <field experiences /practicum>
	MFB014E	In my <field experience / practicum> I had to demonstrate to my supervising teacher that I could teach according to the same criteria/standards used in my <university/college> <courses>

Variable Name:	MFB14STF	
Description:	OPPORTUNITIES TO LEARN (OTL) – Supervising Teacher Feedback Quality	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with the following statements about the <field experience and/or practicum> you had in your teacher preparation program?	
	MFB014F	The feedback I received from my <supervising teacher/mentor/instructors> helped me to improve my understanding of pupils
	MFB014G	The feedback I received from my <supervising teacher/mentor/instructors> helped me improve my teaching methods
	MFB014H	The feedback I received from my <supervising teacher/mentor/instructors> helped me improve my understanding of the curriculum
	MFB014I	The feedback I received from my <supervising teacher/mentor/instructors> helped me improve my knowledge of mathematics content

Variable Name:	MFB15COH	
Description:	OPPORTUNITIES TO LEARN (OTL) – Program Coherence	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Consider all of the <courses> in the program including subject matter <courses> (e.g., mathematics), mathematics <pedagogy> <courses>, and general education <pedagogy> <courses>. Please indicate the extent to which you agree or disagree with the following statements.	
	MFB015A	Each stage of the program seemed to be planned to meet the main needs I had at that stage of my preparation
	MFB015B	Later <courses> in the program built on what was taught in earlier <courses> in the program
	MFB015C	The program was organized in a way that covered what I needed to learn to become an effective teacher
	MFB015D	The <courses> seemed to follow a logical sequence of development in terms of content and topics
	MFB015E	Each of my <courses> was clearly designed to prepare me to meet a common set of explicit standard expectations for beginning teachers
	MFB015F	There were clear links between most of the <courses> in my teacher education program

Variable Name:	MFD1RULE	
Description:	BELIEFS ABOUT THE NATURE OF MATHEMATICS - Rules and Procedures	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with the following beliefs about the nature of mathematics?	
	MFD001A	Mathematics is a collection of rules and procedures that prescribe how to solve a problem
	MFD001B	Mathematics involves the remembering and application of definitions, formulas, mathematical facts and procedures
	MFD001E	When solving mathematical tasks you need to know the correct procedure else you would be lost
	MFD001G	Fundamental to mathematics is its logical rigor and preciseness
	MFD001K	To do mathematics requires much practice correct Application of routines, and problem solving strategies
	MFD001L	Mathematics means learning, remembering and applying

Variable Name:	MFD1PROC	
Description:	BELIEFS ABOUT THE NATURE OF MATHEMATICS - Process of Inquiry	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with the following beliefs about the nature of mathematics?	
	MFD001D	In mathematics many things can be discovered and tried out by oneself
	MFD001F	If you engage in mathematical tasks, you can discover new things (e.g., connections, rules, concepts)
	MFD001H	Mathematical problems can be solved correctly in many ways
	MFD001I	Many aspects of mathematics have practical relevance
	MFD001J	Mathematics helps solve everyday problems and tasks

Variable Name:	MFD2TEAC	
Description:	BELIEFS ABOUT LEARNING MATHEMATICS - Teacher Direction	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	From your perspective, to what extent would you agree or disagree with each of the following statements about learning mathematics?	
	MFD002A	The best way to do well in mathematics is to memorize all the formulas
	MFD002B	Pupils need to be taught exact procedures for solving mathematical problems
	MFD002C	It doesn't really matter if you understand a mathematical problem, if you can get the right answer
	MFD002D	To be good in mathematics you must be able to solve problems quickly
	MFD002E	Pupils learn mathematics best by attending to the teacher's explanations
	MFD002F	When pupils are working on mathematical problems, more emphasis should be put on getting the correct answer than on the process followed
	MFD002I	Non-standard procedures should be discouraged because they can interfere with learning the correct procedure
	MFD002J	Hands-on mathematics experiences aren't worth the time and expense

Variable Name:	MFD2ACTV	
Description:	BELIEFS ABOUT LEARNING MATHEMATICS - Active Learning	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	From your perspective, to what extent would you agree or disagree with each of the following statements about learning mathematics?	
	MFD002G	In addition to getting a right answer in mathematics, it is important to understand why the answer is correct
	MFD002H	Teachers should allow pupils to figure out their own ways to solve mathematical problems
	MFD002K	Time used to investigate why a solution to a mathematical problem works is time well spent
	MFD002L	Pupils can figure out a way to solve mathematical problems without a teacher's help
	MFD002M	Teachers should encourage pupils to find their own solutions to mathematical problems even if they are inefficient
	MFD002N	It is helpful for pupils to discuss different ways to solve particular problems

Variable Name:	MFD3FIXD	
Description:	BELIEFS ABOUT MATHEMATICS ACHIEVEMENT - Fixed Ability	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with each of the following statements about pupil achievement in <primary/lower secondary> mathematics?	
	MFD003A	Since older pupils can reason abstractly, the use of hands-on models and other visual aids becomes less necessary
	MFD003B	To be good at mathematics you need to have a kind of "mathematical mind"
	MFD003C	Mathematics is a subject in which natural ability matters a lot more than effort
	MFD003D	Only the more able pupils can participate in multi-step problem solving activities
	MFD003E	In general, boys tend to be naturally better at mathematics than girls
	MFD003F	Mathematical ability is something that remains relatively fixed throughout a person's life
	MFD003G	Some people are good at mathematics and some aren't
	MFD003H	Some ethnic groups are better at mathematics than others

Variable Name:	MFD4PREP	
Description:	BELIEFS ABOUT THE PROGRAM AS A WHOLE - Preparedness for Teaching Mathematics	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	Please indicate the extent to which you think your teacher education program has prepared you to do the following when you start your teaching career.	
	MFD004A	Communicate ideas and information about mathematics clearly to pupils
	MFD004B	Establish appropriate learning goals in mathematics for pupils
	MFD004C	Set up mathematics learning activities to help pupils achieve learning goals
	MFD004D	Use questions to promote higher order thinking in mathematics
	MFD004E	Use computers and ICT to aid in teaching mathematics
	MFD004F	Challenge pupils to engage in critical thinking about mathematics
	MFD004G	Establish a supportive environment for learning mathematics
	MFD004H	Use assessment to give effective feedback o pupils about their mathematics learning
	MFD004I	Provide parents with useful information about your pupils' progress in mathematics
	MFD004J	Develop assessment tasks that promote learning in mathematics
	MFD004K	Incorporate effective classroom management strategies into your teaching of mathematics
	MFD004L	Have a positive influence on difficult or unmotivated pupils
	MFD004M	Work collaboratively with other teachers

Variable Name:	MFD5QUAL	
Description:	BELIEFS ABOUT THE PROGRAM AS A WHOLE - Quality of Instruction	
Procedure:	Rasch score scale where 10 is located at the neutral position	
Source:	To what extent do you agree or disagree with the following statements?	
	MFD005A	Model good teaching practices in their teaching
	MFD005B	Draw on and use research relevant to the content of their <courses>
	MFD005C	Model evaluation and reflection on their own teaching
	MFD005D	Value the learning and experiences you had prior to starting the program
	MFD005E	Value the learning and experiences you had in your field experience and or practicum
	MFD005F	Value the learning and experiences you had in your teacher preparation program

Section 3: Future Teacher Knowledge Assessments (Part C)[3]

3.1. Future Primary Teachers

Variable Name:	MCK (Future Primary Teachers)
Description:	Mathematics Content Knowledge
Procedure:	IRT scores with mean of 500 and standard deviation of 100 for equally weighted countries
Source:	The scaling is based on the 74 mathematics content knowledge items administered to the future primary teachers. NOTE: Although standardized to the same mean and standard deviation, the MCK scores for future primary teachers are not comparable to the MCK scores for future lower-secondary teachers as scaling was done separately for both populations.

Variable Name:	MPCK (Future Primary Teachers)
Description:	Mathematics Pedagogy Content Knowledge
Procedure:	IRT scores with mean of 500 and standard deviation of 100 for equally weighted countries
Source:	The scaling is based on the 32 mathematics pedagogy content knowledge items administered to the future primary teachers. NOTE: Although standardized to the same mean and standard deviation, the MPCK scores for future primary teachers are not comparable to the MPCK scores for future lower-secondary teachers as scaling was done separately for both populations.

3.2. Future Lower-Secondary Teachers

Variable Name:	MCK (Future Lower-Secondary Teachers)
Description:	Mathematics Content Knowledge
Procedure:	IRT scores with mean of 500 and standard deviation of 100 for equally weighted countries
Source:	The scaling is based on the 76 mathematics content knowledge items administered to the future lower-secondary teachers. NOTE: Although standardized to the same mean and standard deviation, the MCK scores for future primary teachers are not comparable to the MCK scores for future lower-secondary teachers as scaling was done separately for both populations.

Variable Name:	MPCK (Future Lower-Secondary Teachers)
Description:	Mathematics Pedagogy Content Knowledge
Procedure:	IRT scores with mean of 500 and standard deviation of 100 for equally weighted countries
Source:	The scaling is based on the 27 mathematics pedagogy content knowledge items administered to the future lower-secondary teachers. NOTE: Although standardized to the same mean and standard deviation, the MPCK scores for future primary teachers are not comparable to the MPCK scores for future lower-secondary teachers as scaling was done separately for both populations.

3 Different assessments were administered to the future primary and lower-secondary teachers.