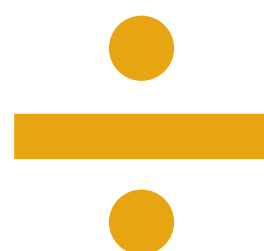




TEDS-M 2008 User Guide for the International Database

Supplement **3**

Edited by Falk Brese with Maria Teresa Tatto



Copyright © 2012 International Association for the Evaluation of Educational Achievement (IEA)

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording, or otherwise without permission in writing from the copyright holder.

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

Publisher: the IEA Secretariat

For more information about the IEA TEDS-M 2008 International Database contact:

IEA Data Processing and Research Center

Mexikoring 37

22297 Hamburg

Germany

Email: teds@iea-dpc.de

Website: www.iea.nl

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.

Copiedited by Katy Ellsworth, Freelance Editing, Delta BC, Canada

Design and production by Becky Bliss Design and Production, Wellington, New Zealand

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 computed¹
- 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:	In the <course> you selected, how often do you give your <future teachers> the opportunity to do the 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 part 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 pupils 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 program
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:	<p>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.</p> <p>MFB015A Each stage of the program seemed to be planned to meet the main needs I had at that stage of my preparation</p> <p>MFB015B Later <courses> in the program built on what was taught in earlier <courses> in the program</p> <p>MFB015C The program was organized in a way that covered what I needed to learn to become an effective teacher</p> <p>MFB015D The <courses> seemed to follow a logical sequence of development in terms of content and topics</p> <p>MFB015E Each of my <courses> was clearly designed to prepare me to meet a common set of explicit standard expectations for beginning teachers</p> <p>MFB015F There were clear links between most of the <courses> in my teacher education program</p>

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:	<p>To what extent do you agree or disagree with the following beliefs about the nature of mathematics?</p> <p>MFD001A Mathematics is a collection of rules and procedures that prescribe how to solve a problem</p> <p>MFD001B Mathematics involves the remembering and application of definitions, formulas, mathematical facts and procedures</p> <p>MFD001E When solving mathematical tasks you need to know the correct procedure else you would be lost</p> <p>MFD001G Fundamental to mathematics is its logical rigor and preciseness</p> <p>MFD001K To do mathematics requires much practice correct Application of routines, and problem solving strategies</p> <p>MFD001L Mathematics means learning, remembering and applying</p>

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.

