Learning to read and numerate in the developing world:

Cross-national commonalities and differences in primary school curricula and textbooks

Prof. Aaron Benavot

Seminar, Graduate School of International Development, NagoyaUniversity

UNIVERSITY AT ALBANY
State University of New York

UNESCO

A real team effort!

Thanks to the following colleagues and students for their expertise and efforts in support of this large-scale project:

- Dr. Gilbert Valverde
- Dr. Samira Alayan
- Dr. Lilia Verónica Toranzos
- Dr. Yi-Jung Wu
- Gloria Zambrano
- Treisy Romero
- Marcellus Taylor
- Polinda Keo
- Fadi Kanaan
- Zakhar Berkovich
- Laurence Padjip
- Julliet Ochienghs
- Laura Manley
- Dr. Prachayani Praphamontripong
- Yaser Robles
- Hue Do
- Perveen Faisal
- Muhammad Mubeen
- Newshaw Bahreyni
- Rostati Rostati
- Chinthaka Jayawardena
- Faisal Yaqoob
- Zafar Aminov
- Dhanushki Samaranayake

Project was funded by UNESCO's Institute for Statistics, Montreal Canada

Preliminary Remarks

In contrast to many existing cross-national studies of curricula and textbooks, this study:

- Mainly addresses policy concerns/debates around ‘quality education’ and learning outcomes, and not a specific issue in the analysis of school curricula (eg, gender roles, human rights, inclusion)
- Focuses on international, rather that national, level policies
- Focuses on end of primary cycle (grades 4-6), not secondary educ
- Analyzes ‘core’ subjects—reading and mathematics—and not subjects in the social sciences (history, geography, civics, environ)
- Focuses exclusively on countries in the developing world
- Depicts cross-national patterns in the current period and not changes over time
- Codes textbooks and curricula using native language speakers

Outline of Presentation

1. Background: Recent international policies/UNESCO initiatives to improve quality education in the developing world
2. Creating an international collection of official curricular documents in reading and mathematics-ICATA
3. Examining the diversity & representativeness of analyzed curricular materials
4. Three main research questions
5. Methods: Coding frameworks and coding process
6. Results, Summary and Caveats
7. Conclusion and Next Steps

International policy: EFA & Quality

- In 1990, Jomtien Thailand, the Education for All agenda emerged - an 'expanded vision of basic education' – committing governments, international agencies, donors and NGOs to 'universal access to, and completion of, primary education by 2000'
- In 2000, Dakar Senegal, the World Education Forum agreed that by 2015 'all children…will have access to and complete free and compulsory primary education of good quality.' More comprehensive set of six EFA goals was established
- EFA Goal 6: "Improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills"

UNESCO Initiatives on Quality

- Main interagency initiatives (2000-2010): 'But Can They Read', 'From Access to Success'; **'Learning Counts'; 'International Working Group on Assessing and Improving Quality Learning'** and Teacher Education in Sub-Saharan Africa (TISSA)
- UNESCO involved in regional learning assessments in Latin America and sub-Saharan Africa
- On-going shift in monitoring quality education: from a focus on monitoring inputs and enabling conditions (eg, pupil-teacher ratios, teacher qualifications, textbook availability, expenditures) to learning outcomes—especially in literacy, numeracy and 'life skills'

Specific Background to this Study

- Linked to International Education for All Agenda: Emerging priority since 2000--quality education & learning outcomes
- Captures policy shift: from access to quality issues; from monitoring inputs to outcomes; though learning process still 'black box'
- Initially part of UNESCO inter-agency initiative: 'Learning Counts' (2008-2010)
- Present study was one of several commissioned by UIS as background for the 'International Working Group on Assessing and Improving Quality Learning'

Main aims: Create int'l curriculum archive and explore commonalities

Aim: To obtain official curriculum documents in reading and mathematics for the upper grades of primary education in a diverse range of developing countries, and identify curricular commonalities/ differences

- Specific focus: The intended curriculum guidelines and Textbooks in reading and mathematics for grades 4-6
- Means: Official networks e.g. IBE, UNESCO, MoE web sites
- Non-official networks: int'l colleagues and scholars; UAlbany int'l students

Creation of International Curriculum and Textbook Archive: ICATA

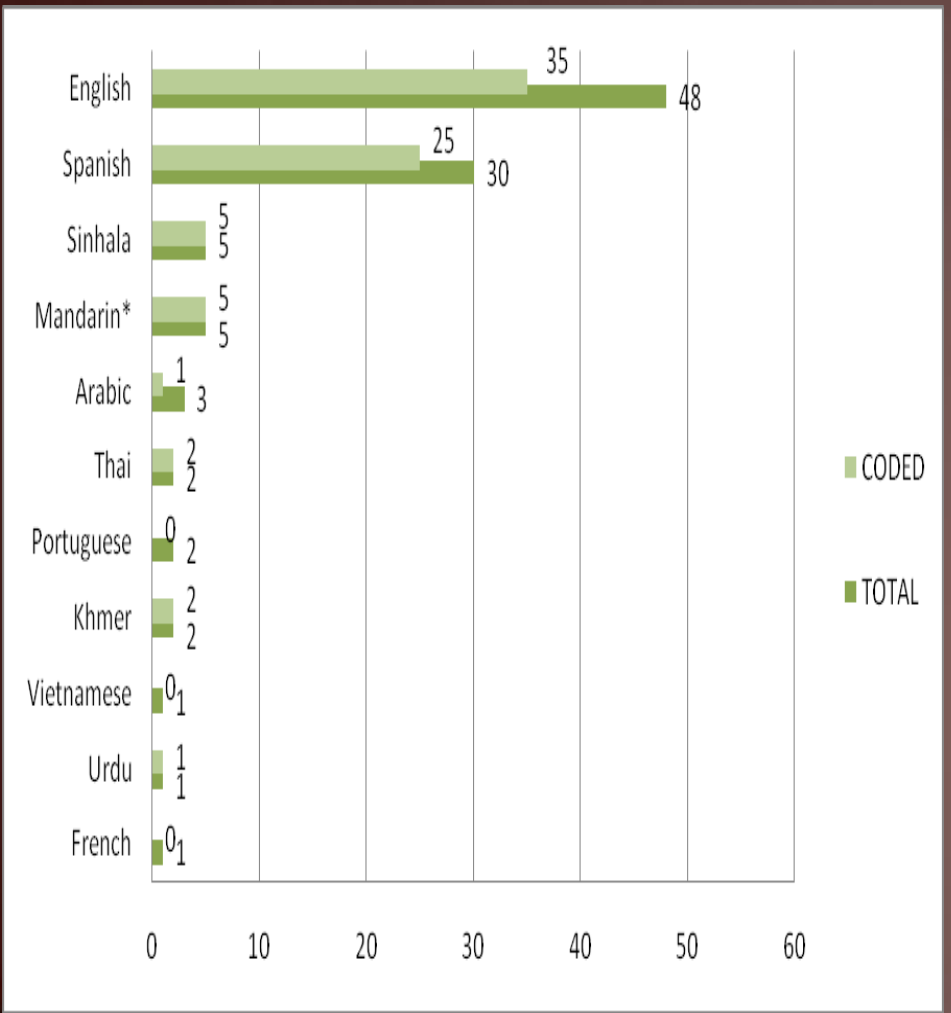
- ICATA contains over 700 documents
- Includes different document types: official guidelines, policy statements, teacher guides, textbooks, exercise books and (a few) exams
- Documents come from over 60 countries
- Two main doc categories: 1) Official curriculum guidelines; 2) Textbooks
- About 60% of relevant documents coded
- (Additional documents compiled but not coded: out of date, other subjects/grades)

Countries Represented in Archive

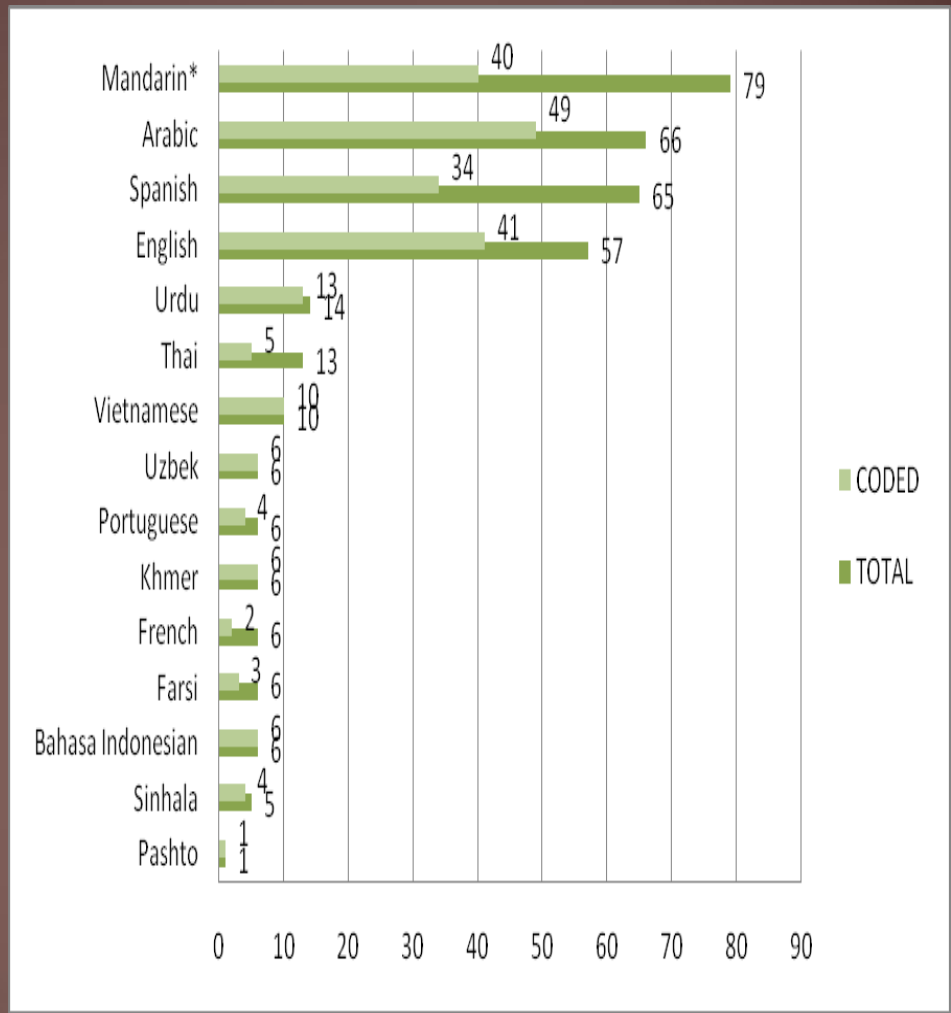
Egypt	Bahamas	Indonesia	Belize	Nicaragua	Iran	Namibia
Jordan	Bermuda	Papua New Guinea	Brazil	Panama	Pakistan	Senegal
Lebanon	Dominican Republic	Philippines	Chile	Paraguay	Sri Lanka	South Africa
Palestinian Autonomous Territories	Eastern Caribbean*	Singapore	Colombia	Peru	Angola	Uganda
Qatar	Jamaica	Taiwan	Costa Rica	Venezuela	Benin	Armenia
Syrian Arab Republic	Saint Lucia	Thailand	Ecuador	Trinidad & Tobago	Botswana	Kyrgyzstan
Tunisia	Cambodia	Vietnam	El Salvador	Afghanistan	Ghana	Uzbekistan
United Arab Emirates	China (+two major cities)	Sudan (south)	Guatemala	Bangladesh	Lesotho	
Libya	Hong Kong	Argentina	Mexico	India	Mauritius	Malta

Language Diversity: Documents coded in 15 different languages

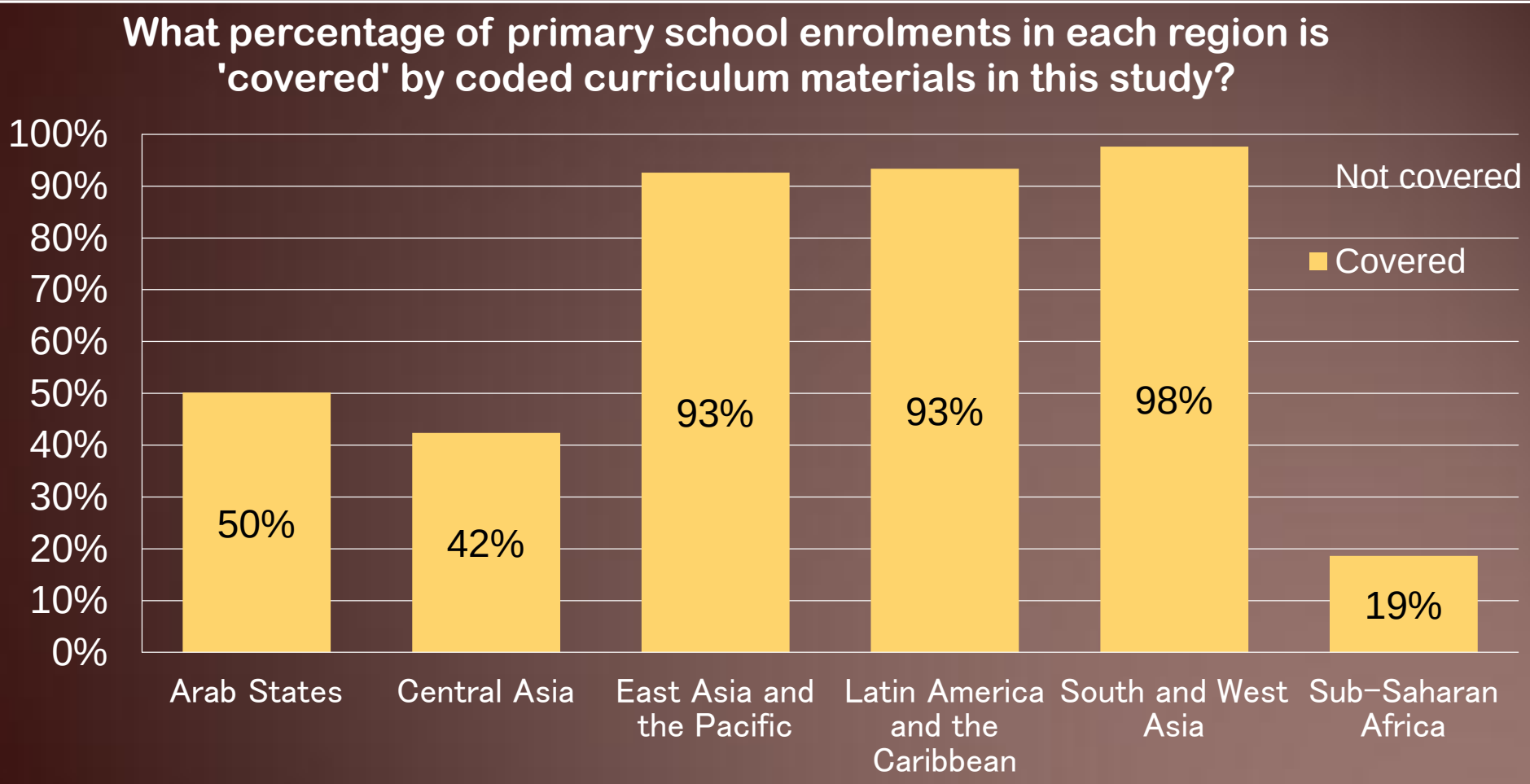
Curricular Guidelines



Textbooks



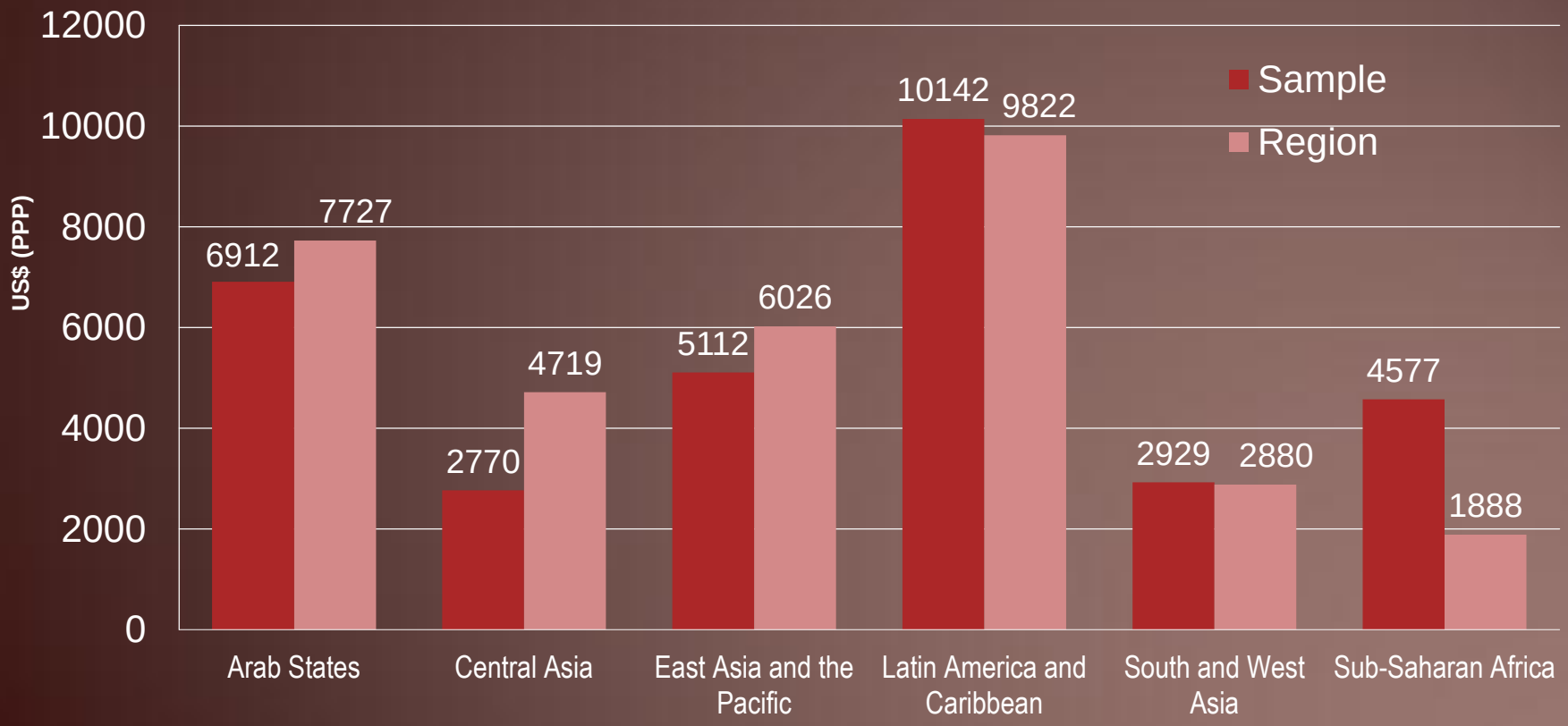
Enrollments of countries in analysis relative to enrollments in region



Only enrolments in developing countries are included in regional calculations

Average income of countries in analysis relative to average income in region

How representative are countries in study to all developing countries in the region, by weighted regional averages* of GNP per capita?



Only developing countries are included in the calculation of regional averages

Three Research Questions

1) To what extent do diverse developing countries in the world define similar contents and performance expectations in reading and mathematics in the upper grades of primary education? (the *commonalities* issue- International policy)

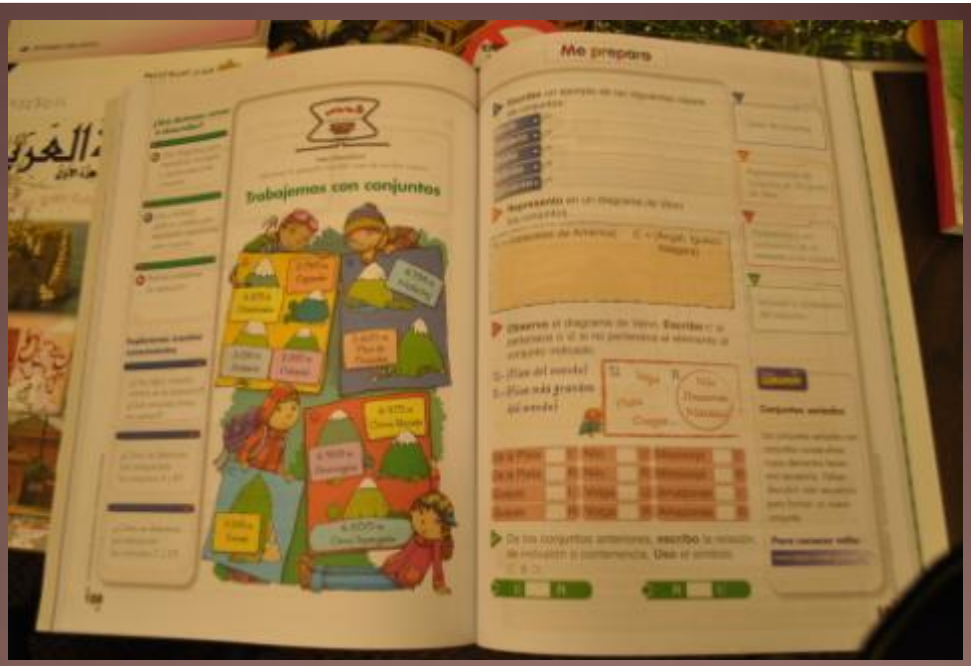
2) To what extent do the content domains of official curriculum statements in reading and mathematics align with those found in relevant textbooks? (the *alignment* issue- National policy)

3) In which countries are performance expectations in mathematics curricula more (or less) cognitively challenging? (the *challenging curriculum* issue- Curriculum developers)

[In the future performance expectations in reading will be explored.]

Challenge: How to characterize (and compare) the entire contents of a curricular guideline or textbook, not a specific topic within them

Coding Frameworks (from TIMSS & PIRLS)



Coding Process

Coding the intended contents of mathematics & reading

- Study draws upon detailed coding frameworks from TIMSS and PIRLS to define two basic dimensions of the mathematics and reading curriculum: 1) the intended topics, issues and contents taught in each subject; and 2) the standards that students are expected to achieve in each subject at a given grade level (or cycle)
- The first dimension--contents--reflects the subject knowledge domains; the latter--performance expectations--refers to the skills and competences that students are expected to possess as a consequence of classroom instruction
- Detailed TIMSS and PIRLS coding schemes were simplified
- Also, coding frameworks cover a wider range of knowledge than one would expect to find primary-level textbooks in developing countries
- Note: the same subject coding framework was used for both curricular statements/ guidelines and textbooks

Coding framework in mathematics

- The mathematics framework is divided into 10 general content topics (2 digit) that are divided into detailed sub-categories (3 digit) and even sub-sub-categories (4 digit) .
- The topics range from simple mathematical concepts (e.g., whole numbers, fractions and decimals) and operations to more complex topics such as geometry, proportionality and data representation (45 different topics used)
- Performance expectations in mathematics are organized from simple to more complex.
- Five major performance expectations: knowing; using routine procedures; investigating and problem solving; mathematical reasoning; and communicating. (29 codes for PEs)
- Each performance standard is further subdivided into one or more specific competencies

Coding Framework In Math (Contents)

Math Coding Framework (Contents)

Math Coding Framework (Performance Expectations)

2 Performance Expectations

2.1 Knowing

2.1.1 Representing

Select an appropriate representation
Construct an appropriate informal representation for the subject (e.g., a sketch)
Construct a formal representation governed by strict construction procedures

2.1.2 Recognizing equivalents

Indicate recognition of an equivalence by identification or selection

Construct an object equivalent to a given object or two equivalent object of a certain category
Select or construct an object and its equivalent decomposition or two equivalent decompositions

2.1.3 Recalling mathematical objects and properties

Recalling mathematical objects and properties
Recognizing mathematical objects and properties

2.2 Using routine procedures

2.2.1 Using equipment

2.2.1.1 Using instruments, for example, measuring instruments
2.2.1.2 Using computational devices

2.2.2 Performing routine procedures

2.2.2.1 Counting

2.2.2.2 Computing

Identify an appropriate single computational operation

Identify an appropriate single computational method

Predict the effect of a computation operation or method

Coding framework in reading

The reading framework consists of three dimensions

1. The types of written texts that students can expect to find in reading textbooks and guidelines
2. The key elements of written texts (e.g., types and structure of plots, purposes and functions of written texts)
3. Various performance expectations in reading which examine levels of reading comprehension.

Coding framework in reading

- The coding framework lists 68 different types of written texts that can be found in reading textbooks and official guidelines
- The key elements of written texts include, eg, types and structure of plots, purposes and functions of texts, which are further subdivided into more specific categories (58 total codes are used)
- Performance expectations in reading (total codes=10) are divided into four types of reading comprehension:
  1. literal comprehension (e.g., identifying parts of the text, remembering what is written)
  2. inferential comprehension (e.g., compare, deduce, generalize, apply)
  3. value or evaluative comprehension (judgments about text)
  4. meta-comprehension (e.g., formulating and proving hypotheses; continued reading, elaborate analogies)

Coding Framework In Reading (Types of Texts)

65+ Types of written texts

- Riddle
- Posters .Banner
- Ad
- Opinion Article
- Notice
- Biography
- Letter
- Signs
- Catalog
- Comment
- Contract
- Chronicle
- Story / Tale
- Curriculum Vitae
- Joke
- National form of verse
- Definition
- Personal Diary
- Dictionary
- Housekeeping Journal
- Dissertation
- Editorial
- Encyclopedia
- Essay
- Interview
- Epitaph
- Tags, Labels
- Fable
- Bill
- Brochure
- Form
- Graphic, Graph
- Tourism guide
- Science fiction story
- Real life story
- Mystery story
- Comics
- Report
- Instruction (Procedure)
- Invitations
- ~~Sign~~
- Law
- Legend, myth
- School textbook
- Manual
- Map
- Menu
- Monograph
- Annotation
- News item
- Novel
- Play
- Newspaper
- Poem
- Postcards
- Weather forecast
- Proverb
- Recipe
- Receipt
- Saying
- Historic account
- Article
- Review
- Magazine
- Labels, signs, heading
- Table
- Cards
- Religious text
- Song
- Others

Reading Coding Framework (Contents)

1.1. Function
- 1.1.1. Informative
- 1.1.2. Expressive
- 1.1.3. Literary
- 1.1.4. Appealing
- 1.1.5. Factual
- 1.1.6. Metalinguistics

1.2. Types of Plot
- 1.2.1. Narrative
- 1.2.2. Descriptive
- 1.2.3. Explanatory, expositive
- 1.2.4. Argumentative
- 1.2.5. Conversational

1.3. Structure of the Plot
- 1.3.1. Exposition, thesis, introduction
- 1.3.2. Conflict, argument, rising action
- 1.3.3. Falling action, conclusion. resolution

1.4. Structural Elements of the Plot
- 1.4.1. Categories and types of relations
  - Cause, Effect, Problem, Solution
- 1.4.2. Narrative point of view
  - In first person
  - In second person
  - In third person
- 1.4.3. Characters (degree of importance and motivation)
- 1.4.4. Linguistic markers
  - Verbs, Nouns, Adjectives, Adverbs, Connectors (conjunctions, prepositions, etc.)

1.5. Elements of textbooks
- 1.5.1. Author
  - 1.5.1.1. Purpose
  - 1.5.1.2. Perspective
  - 1.5.1.3. Nationality

Reading Coding Framework (Performance Expectations)

1. Performance expectations (skills/competences to be acquired)

1.1. **Literal comprehension** (elements explicitly found in the text)
- 1.1.1. Explicit information found in the text
  Identify, Extract, Find, Remember

1.2. **Inferential comprehension** (use/handling of implicit elements in the text).
- 1.2.1. Types of inference, according to the operation
  Differentiate, Compare, Deduct, Generalize, Apply, Interpret, Reorganize, Relate/Connect, Summarize, Paraphrase, Include

1.3. **Value or evaluative comprehension** (judge reading elements against values, norms, and criteria)
- 1.3.1. Judgments about
  Precision-vagueness
  Coherence-incoherence
  Complexity-simplicity
  Validity and/or reliability
  Completeness of the information
  The probability or plausibility
  The contrast with values and/or personal experience
  The contrast with socio-cultural values or experiences

1.4. **Meta-comprehension**
- 1.4.1. Strategies
  Formulate hypotheses
  Prove hypotheses
  Predict
  The content, The ending, Information
- 1.4.2. Reread
- 1.4.3. Continue reading
- 1.4.4. Generate mental images
- 1.4.5. Elaborate analogies
- 1.4.6. Ask
- 1.4.7. Identify antecedents/background (correspondence)

Reading Coding Framework (Performance Expectations)

Performance expectations

Literal comprehension (elements **explicitly** found in the text)
Explicit information found in the text
Identify
Extract
Find
Remember

Inferential comprehension (use/handling of **implicit** elements in the text).
Types of inference, according to the operation
Differentiate
Compare
Deduct
Generalize
Apply
Interpret
Reorganize
Relate/Connect
Summarize

Value or evaluative comprehension
(judge reading elements against values, norms
criteria)
Judgments about
Precision-vagueness
Coherence-incoherence
Complexity-simplicity
Validity and/or reliability
Completeness of the information
The probability or plausibility
The contrast with values and/or personal expe
The contrast with socio-cultural values or exp

Metacomprehension
Strategies
Formulate hypotheses
Prove hypotheses
Predict
The content
The ending
Information

Training Coders and Coding Process

Applying complex coding frameworks to actual curricular materials in different languages

- Pilot phase and training sessions: Application and adjustments to frameworks; Week-long training at UAlbany with language proficient coders; Weekly team meetings to identify coding problems and solutions; Training of new coders and language specialists
- Coding procedures: Coder divides archived document into ‘segments’; reviews each segment and lists a series of (3 or 4 digit) codes relevant to content and performance expectations found in segment.
- (Later completes supplemental questionnaire)

Examples of coded documents (1)

UNESCO-sponsored Cross-national project on the Intended Curriculum in Primary School Mathematics and Reading

Document Analysis Form

Country name: Cambodia

Document ID code 03321005

Coder Name: Polinda Keo

Date of Coding: 10 / 24 /09

Document Type: ☐ Curriculum ☑ Textbook ☐ Test ☐ Exercise ☐ Guildeline

Subject: ☑ Mathematics ☐ Reading ☐ Multiple

Semester: ☑ Year ☐ First Semester ☐ Second Semester

Unit ID #	Unit Type	Page Range in Unit	Grades							Primary **Content** Codes				Primary **Performance** Code				
			0	1	2	3	4	5	6									
1	3	1-15	☐	☐	☐	☐	☐	☐	☑	1112	1141	1142	1121	212	213	2222	231	233
2	3	16-23	☐	☐	☐	☐	☐	☐	☑	1145	1112	1113	1125	2222	2224	213		
3	3	24-33	☐	☐	☐	☐	☐	☐	☑	1125	1112	1113	1121	213	2222	233		
4	3	34-45	☐	☐	☐	☐	☐	☐	☑	1112	1121	1125		212	213	2222	2224	
5	3	46-53	☐	☐	☐	☐	☐	☐	☑									
6	3	54-63	☐	☐	☐	☐	☐	☐	☑	1112	1122	1123	134	2222	213			
7	3	64-75	☐	☐	☐	☐	☐	☐	☑	133	162	122		2224	2225	2222		
8	3	76-87	☐	☐	☐	☐	☐	☐	☑	134	121	131	135	211	212			
9	3	88-97	☐	☐	☐	☐	☐	☐	☑	122	123			211	2211	2222	2225	
10	3	98-111	☐	☐	☐	☐	☐	☐	☑	1123	1124	1125		213	2222			
11	3	112-119	☐	☐	☐	☐	☐	☐	☑	1124				213				
12	3	120-125	☐	☐	☐	☐	☐	☐	☑									
13	3	126-140	☐	☐	☐	☐	☐	☐	☑									
			☐	☐	☐	☐	☐	☐	☐									
			☐	☐	☐	☐	☐	☐	☐									
			☐	☐	☐	☐	☐	☐	☐									
			☐	☐	☐	☐	☐	☐	☐									
			☐	☐	☐	☐	☐	☐	☐									
			☐	☐	☐	☐	☐	☐	☐									

Examples of coded documents (2)

UNESCO-sponsored Cross-national project on the Intended Curriculum in Primary School Mathematics and Reading

Document Analysis Form

Country name: Nicaragua
Document ID code: 130 13 001

Coder Name: Treisy Romero
Date of Coding: 01/05/2010

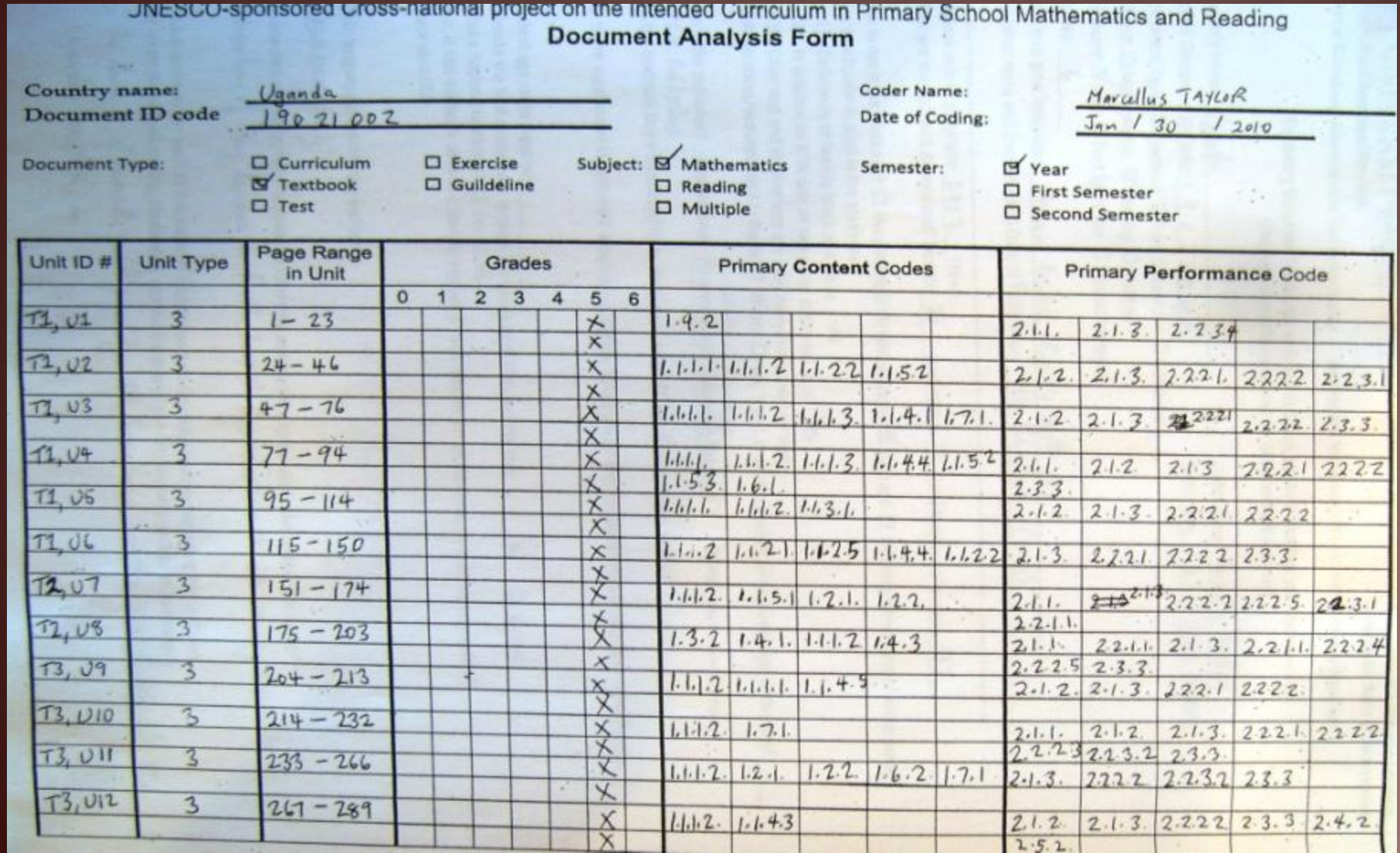
Document Type: ☑ Curriculum ☐ Textbook ☐ Test ☐ Exercise ☐ Guildeline

Subject: ☐ Mathematics ☑ Reading ☐ Multiple

Semester: ☑ Year ☐ First Semester ☐ Second Semester

Unit ID #	Unit Type	Page Range in Unit	Grades							Primary **Content** Codes					Primary **Performance** Code			
			0	1	2	3	4	5	6									
1	3	1-24						✓		1.1.23	1.1.54	1.2.18	1.1.13	1.1.60	2.1.1	2.2.1	2.3.1	
										1.1.3	1.1.35	1.7.13	1.4.1					
2	3	4-6						✓		1.1.23	1.1.19				2.1.1	2.2.1	2.3.1	
3	3	6-7						✓		1.1.50	1.3.1				2.1.1	2.2.1	2.3.1	
4	3	7-8						✓		1.1.51	1.1.16	1.1.43	1.1.54	1.1.55	2.1.1	2.2.1	2.3.1	

Examples of coded documents (3)



UNESCO-sponsored Cross-national project on the Intended Curriculum in Primary School Mathematics and Reading

Document Analysis Form

Country name: Uganda
Document ID code 190 21 002

Coder Name: Marcellus TAYLOR
Date of Coding: Jan / 30 / 2010

Document Type: ☐ Curriculum ☑ Textbook ☐ Test ☐ Exercise ☐ Guildeline

Subject: ☑ Mathematics ☐ Reading ☐ Multiple

Semester: ☑ Year ☐ First Semester ☐ Second Semester

Unit ID #	Unit Type	Page Range in Unit	Grades 0 1 2 3 4 5 6	Primary Content Codes	Primary Performance Code
T1, U1	3	1 – 23	X	1.9.2	2.1.1. 2.1.3. 2.2.3.4
T1, U2	3	24 – 46	X	1.1.1.1. 1.1.1.2 1.1.2.2 1.1.5.2	2.1.2. 2.1.3. 2.2.2.1. 2.2.2.2 2.2.3.1
T1, U3	3	47 – 76	X	1.1.1.1. 1.1.1.2 1.1.1.3. 1.1.4.1 1.7.1.	2.1.2 2.1.3 2.2.2.2.1 2.2.2.2 2.3.3.
T1, U4	3	77 – 94	X	1.1.1.1. 1.1.1.2. 1.1.1.3. 1.1.4.4 1.1.5.2 1.1.5.3. 1.6.1.	2.1.1. 2.1.2 2.1.3 2.2.2.1 2.2.2.2 2.3.3.
T1, U5	3	95 – 114	X	1.1.1.1. 1.1.1.2. 1.1.3.1.	2.1.2 2.1.3. 2.2.2.1 2.2.2.2
T1, U6	3	115 – 150	X	1.1.1.2 1.1.2.1. 1.1.2.5 1.1.4.4. 1.1.2.2	2.1.3. 2.2.2.1 2.2.2.2 2.3.3.
T2, U7	3	151 – 174	X	1.1.1.2. 1.1.5.1 1.2.1. 1.2.2.	2.1.1. 2.1.3 2.2.2.2 2.2.2.5 2.3.3.1 2.2.1.1.
T2, U8	3	175 – 203	X	1.3.2 1.4.1. 1.1.1.2 1.4.3	2.1.1. 2.2.1.1. 2.1.3. 2.2.1.1. 2.2.2.4 2.2.2.5 2.3.3.
T3, U9	3	204 – 213	X	1.1.1.2 1.1.1.1. 1.1.4.3	2.1.2. 2.1.3. 2.2.2.1 2.2.2.
T3, U10	3	214 – 232	X	1.1.1.2. 1.7.1.	2.1.1. 2.1.2 2.1.3. 2.2.2.1 2.2.2.2
T3, U11	3	233 – 266	X	1.1.1.2. 1.2.1. 1.2.2. 1.6.2 1.7.1	2.2.2.3 2.2.3.2 2.3.3. 2.1.3. 2.2.2.2 2.2.3.2 2.3.3
T3, U12	3	267 – 289	X	1.1.1.2. 1.1.4.3	2.1.2 2.1.3. 2.2.2.2 2.3.3 2.4.2. 2.5.2.

Codes organized for each country by subject, document type and grade level

Creation of 8 'Master' Tables:

1. Mathematics Text Books 5th & 6th Grades
2. Mathematics Text Books 6th Grade only
3. Mathematics Curriculum Guidelines 5th & 6th Grades
4. Mathematics Curriculum Guidelines 6th Grade only
5. Reading Textbooks 5th & 6th Grades
6. Reading Textbooks 6th Grade only
7. Reading Curriculum Guidelines 5th & 6th Grades
8. Reading Curriculum Guidelines 6th Grade only

Reported results based on master tables in yellow-- info for grades 5 & 6

Number of countries in Master Tables (benchmark of 70% to define commonalities)

Document type		Subject	
		Mathematics	Reading
Curriculum Guidelines	Grade 6 (only):	27	23
	Grades 5 & 6	30 (21)	25 (18)
Textbooks	Grade 6	33	32
	Grades 5 & 6	31 (22)	30 (21)

(Parenthesis: # of countries that must have same codes to reach 70% benchmark)

Results


Matematika
5
RIEŠUTAS
Matematikos
vadovėlis
4
МАТЕМАТИК V
11921002
2007
YUWEN
语文
9
THEMATIQUE CM1
Mathematic
for Primary Schools
Pupils' Book 6
9×6=54
10×6=60
11×6=66
12×6=72
Mathematical Association of Ghana
5

Results: Commonalities in Mathematics

(Pooled info for grades 5 and 6)

- Much common ground (across at least 70% of examined developing countries) in knowledge domains and performance expectations of mathematics textbooks and curricular guidelines (pooled info from grades 5 and 6).
- Most textbooks and guidelines include instruction in: whole numbers (their meaning, operations and properties), fractions and decimals; measurement issues; two- and three-dimensional geometry; and data representation and analysis. Proportionality concepts and problems are common to textbooks but not guidelines.
- Examples of content domains not in common: Integer, rational and real numbers; Other number concepts; functions, relations and equations; as well as probability and statistics.

Results: Commonalities in Mathematics

(Pooled info for grades 5 and 6)

- Common performance expectations (in both textbooks and guidelines) include: representing math expressions and recognizing equivalents; using measuring instruments (in textbooks); performing various kinds of counting, computing and measuring (but not graphing) procedures; investigating and problem solving. Using more complex procedures was common in guidelines but not textbooks.
- Overall, commonalities in math standards mainly revolve around *routine and basic skills* in mathematical problem solving and reasoning, and not in relation to the more cognitively demanding skills
- **Overall, fewer commonalities in the contents of official policy statements in mathematics when compared to textbooks**

Results: Commonalities in Reading

- Unlike mathematics, **countries hold more divergent views about the contents of the primary reading curriculum**. Countries vary significantly in the types and functions of the written texts used, the acts of speech learned, as well as the types and structures of plots found in the texts.
- Reading textbooks draw on a diverse array of text types in teaching students to read. From a list of over 60 types of written texts, only 6 show up in 70% or more of all grade 5 and 6 textbooks examined: **stories/tales, poems, plays, letters, historical accounts and biographies**.
- **In official statements and guidelines there is only one common type of written text: poems**.
- Thus, ministry officials and textbook writers hold divergent views as to the texts students should use to acquire reading proficiency

Results: Commonalities in Reading

- **Commonalities in reading textbooks:** 1) written texts are typically informative and express factual informative; 2) they typically have plot types emphasizing narration, description and explanation; 3) they include 1st person, 2nd person and 3rd person accounts; 4) they typically include acts of speech focusing on dialogue; 5) the purpose of the texts is 'to learn something'; and 6) they typically have instructions that ask students to read texts in different modes: read out loud, in silence & by scanning or skimming.
- **None of the above elements are commonly found in official guidelines.** Only one basic element of the reading curriculum is common to both textbooks **and** guidelines—namely, including a written text whose function is to be informative.
- **Commonalities in performance levels—in textbooks and guidelines**. Students should: 1) be able to identify, extract, find and remember **explicit** information in the written text; 2) develop various inference skills: to compare, deduce, generalize, apply, interpret, connect, include summarize and paraphrase **implicit** elements in the text; and 3) develop evaluative judgments about the written texts—e.g., the extent to which they are coherent (or not), precise/opaque, complex/simple, valid, reliable, complete or plausible. More cognitively challenging reading standards were much less common across countries.

Possible reasons for greater commonalities in mathematics than in reading curricula

- Mathematics has a stronger, more well-defined and integrated knowledge structure: knowledge domains are tightly interwoven and sequenced
- International networks of math educators and curriculum developers are denser, more exchanges
- Mathematics is a 'universal' language, whereas acquiring literary skills and competences in an official language is a culturally embedded process. Cultural meanings in reading education are more overt and explicit--eg, shared historical events, prominent cultural and political heroes
- Other reasons?

Second Research Question

- To what extent do diverse developing countries in the world define similar contents and performance expectations in reading and mathematics in the upper grades of primary education? (the *commonalities* issue)

- To what extent do the content domains of official curriculum statements in reading and mathematics align with those found in relevant textbooks? (the *alignment* issue)

- In which countries are performance expectations in mathematics curricula more (or less) cognitively challenging? (the *challenging curriculum* issue)

Curricular Alignment: Comparing intentions with classroom implementation

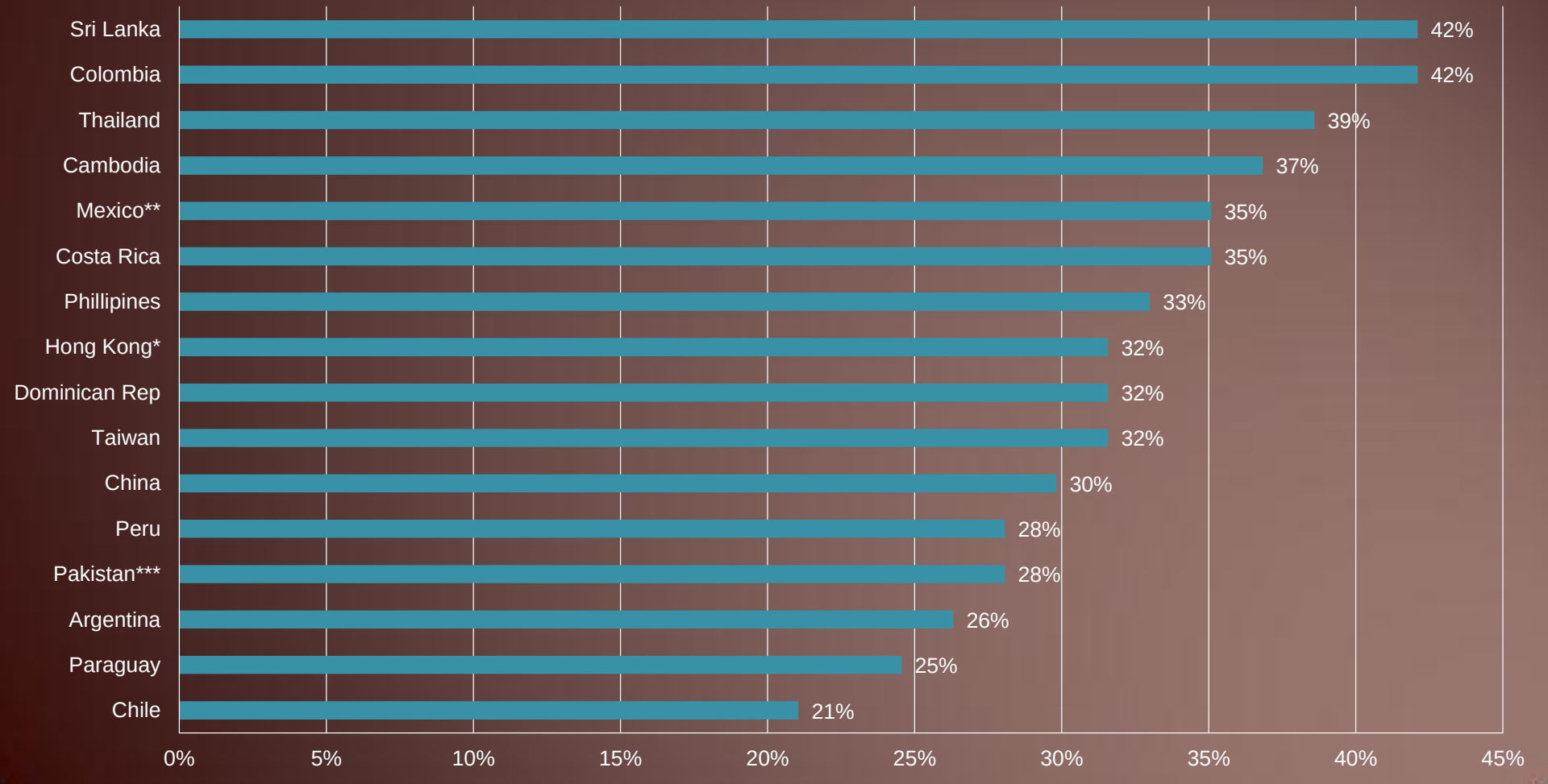
- Important distinction between official, intended curriculum and actual, implemented curriculum (and also received or achieved curriculum)
- Considerable cross-national information available about the intended curriculum and much less about the implemented curriculum; there are different ways to conceive and measure the latter
- In current study, curricular guidelines represent reasonably well the official intended curriculum; textbooks lie in between the intended and the actual implemented curriculum
- Especially in classrooms where teaching is organized in close accordance with the textbook, then textbooks more accurately approximate the actual implemented curriculum. Nevertheless, this tendency varies between classrooms, schools, and within and between countries
- Therefore, makes sense to refer to textbooks as the 'potentially implemented' curriculum (Valverde)

Measuring Curricular Alignment

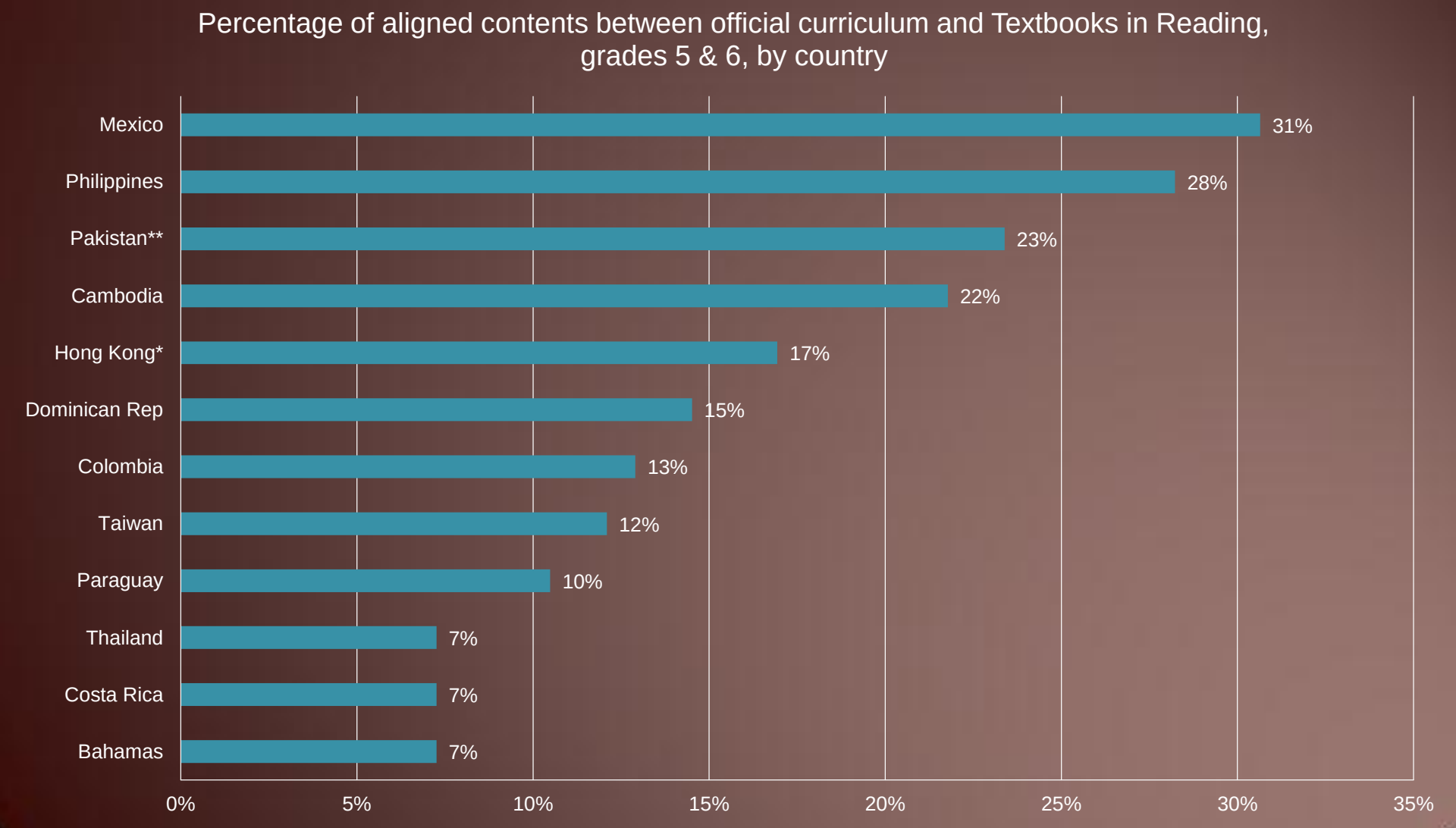
- Determine and compare the content codes found in curricular guidelines and in textbooks for same grade level(s)
- The denominator refer to the total number of content codes that are found in either the guidelines or the textbooks in either grade 5 or grade 6
- The numerator refers to the number of content codes that are found in each subject in BOTH the intended curricular guidelines and the textbooks in either grades 5 and 6
- The constructed percentage refers to the percent of shared or aligned contents per subject area across document types

Results: Curricular Alignment in Mathematics

Percentage of aligned contents between official curriculum and textbooks in mathematics, in grades 5 & 6, by country



Results: Curricular Alignment in Reading



Possible reasons for low alignment levels

- the relatively insular world of subject textbook writers
- the lack of specificity in official guidelines and statements
- the different target audiences addressed by official statements/guidelines and textbook writers
- the high expense of revising/adjusting textbooks in the wake of reforms to official curricular policies
- editors, authors and even curriculum designers rely more on past practices and existing materials, even when strongly urged to operationalize “new” ideas in the next generation of materials
- Other reasons?

Third Research Question

- To what extent do diverse developing countries in the world define similar contents and performance expectations in reading and mathematics in the upper grades of primary education? (the *commonalities* issue)
- To what extent do the content domains of official curriculum statements in reading and mathematics align with those found in relevant textbooks? (the *alignment* issue)

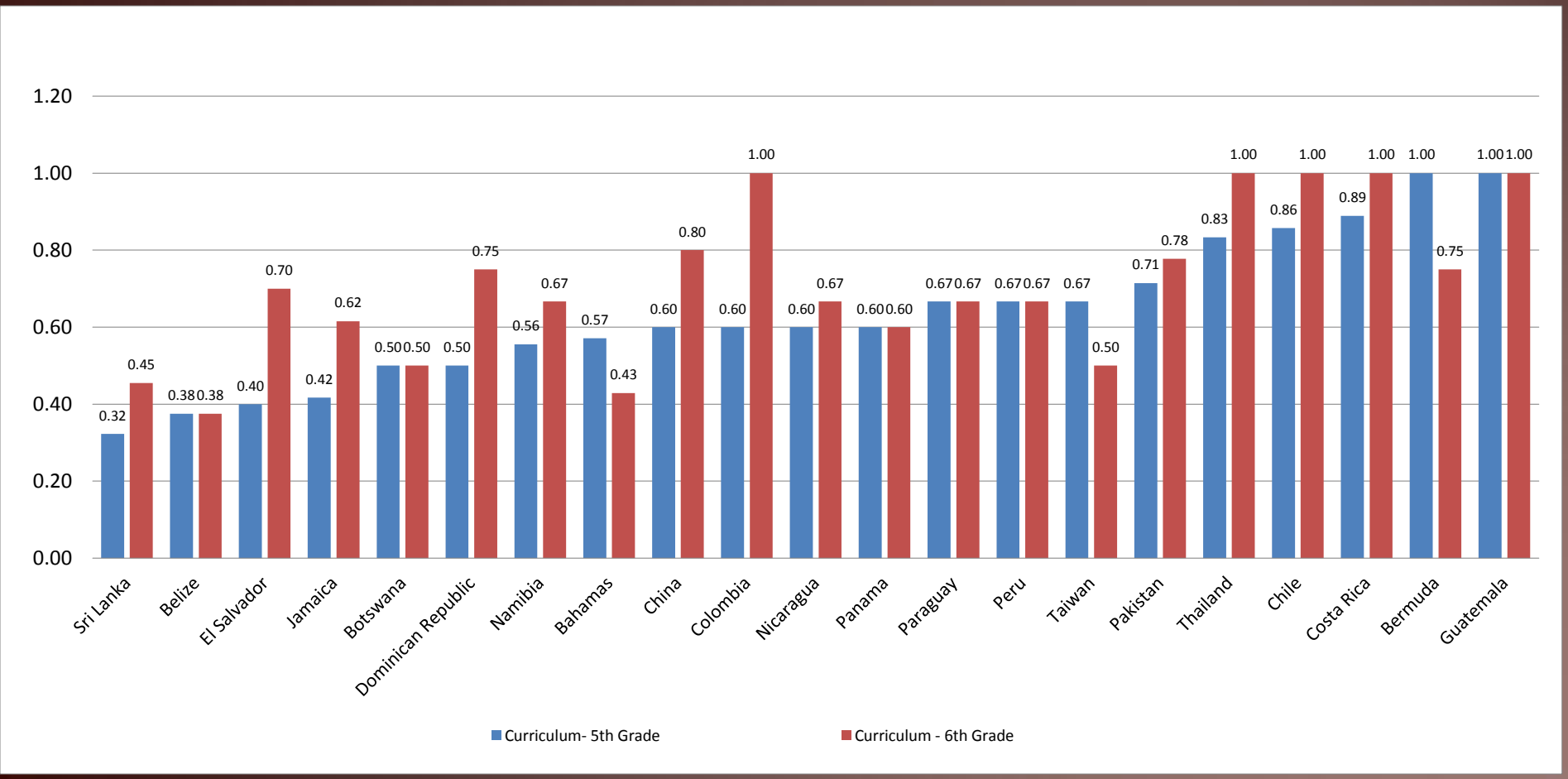
- In which countries are performance expectations in mathematics curricula more (or less) cognitively challenging? (the *challenging curriculum* issue)

Distinguishing more or less Cognitively Demanding Performance Expectations in Math

Least cognitively demanding	Moderately cognitively demanding	Most cognitively demanding
Representing Recognizing equivalents Recalling mathematical objects Using instruments Using computational devices Measuring Using data Classifying data Problem solving Using vocabulary & notation	Comparing Formulating and clarifying problems and situations Developing a strategy Problem solving Relating representations Predicting Verifying Graphing	Developing algorithms Generalizing Conjecturing Justifying and proving Axiomatizing

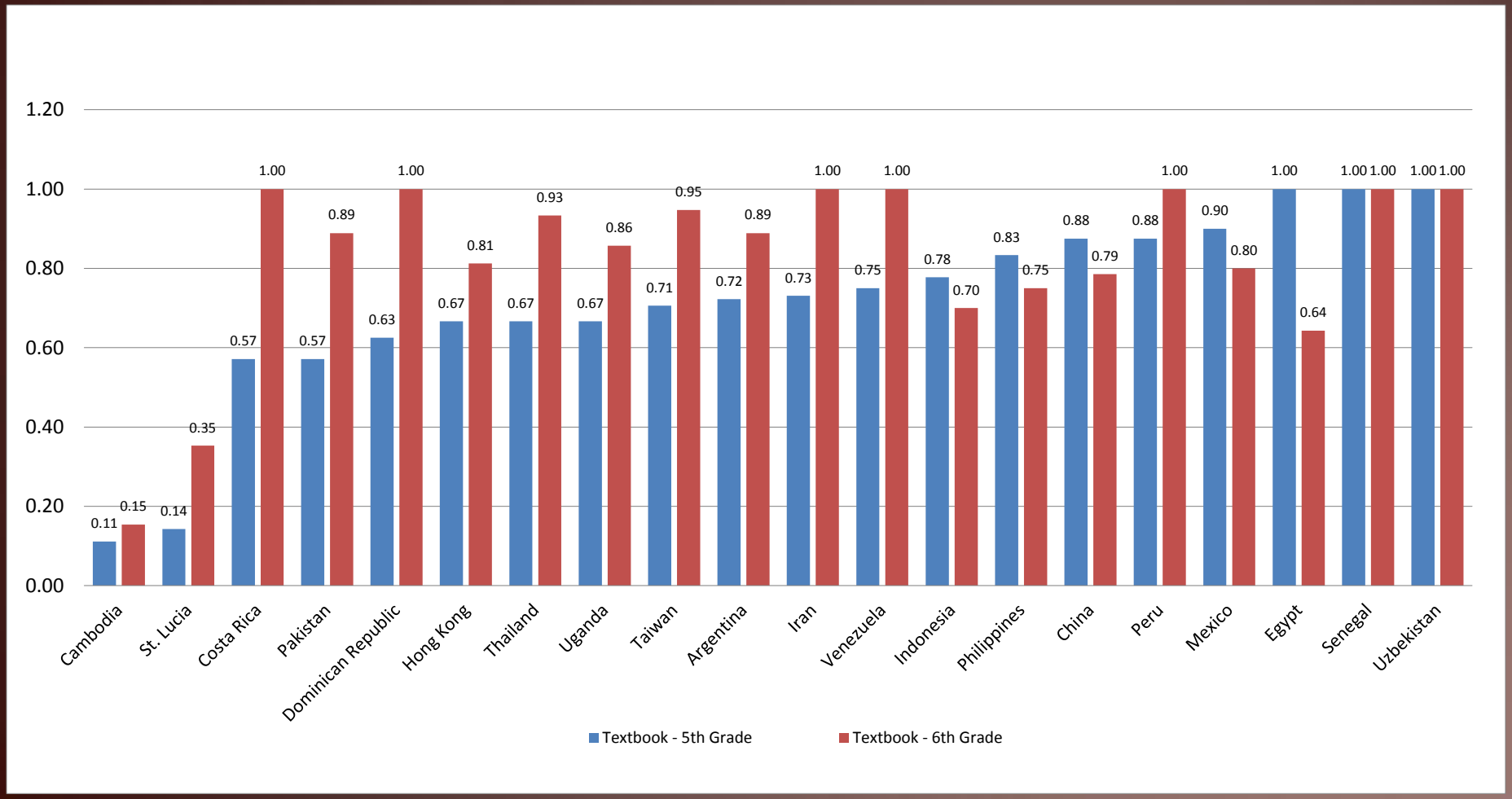
Results: Which countries define challenging performance standards in math guidelines?

Ratio of High performance expectations in math guidelines, by country and grade



Results: Which countries define challenging performance standards in math textbooks?

Ratio of High performance expectations in mathematics textbooks, by country and grade



Overall Summary (1)

- Diverse developing countries hold a fairly consensual and detailed view of what constitutes the mathematics curriculum in upper grades of primary education—both in terms of contents and performance standards. This is especially apparent in mathematics textbooks
- Globalization of policies: evidence of the diffusion and institutionalization of select reforms in math education in the developing world: collecting data; arraying them in simple tables and graphs; understanding simple measures of central tendency and dispersion; and sampling

Summary (2)

- Intended reading curriculum: a more fragmented or heterogeneous picture emerges. Minimal agreement concerning the intended contents and structure of the upper primary grade reading curriculum.
- Performance standards represent the one exception. Most developing countries share common ideas as to the kinds of reading competences students should attain by the end of the primary school cycle
- Not only more commonalities in mathematics than in reading, but there are also more shared contents, or closer alignment, *within* countries between the intended guidelines and textbooks in mathematics

Concluding remarks

- Exploratory nature of the analyses conducted thus far
- Clear evidence of substantial differences--in target audiences, contents and alignment—between official curricular guidelines and textbooks
- More work needed: which factors influence commonalities and alignment patterns in each subject; and which kinds of countries incorporate more cognitively challenging expectations, and for what purposes
- Policy implications for learning assessments in developing countries (for the end of primary cycle)
- Policy implications for educational governance (esp. in teacher training) due to the lack of alignment between intended curricular policies and textbook contents

Next Steps…Further Research

Next Steps

- Complete coding of existing documents (grade 4, new materials, other specialized languages)
- Obtain more complete information for countries with incomplete files or in under-represented regions
- Expand ICATA to include official documents in social sciences and sciences and for lower primary and lower secondary grade levels
- Situate ICATA in emerging Institute of Global Education Policy Studies (IGEPS) at University at Albany-SUNY
- Submit new funding proposals; explore partnerships
- Disseminate findings in conferences, professional meetings and publications

New research and policy questions

- Explore commonalities in important national characteristics: by language group (esp Spanish, Arabic, Chinese, English), world region, political system and alliances, income level
- What is impact of traits of the education system? Eg, primary school cycle, compulsory schooling, textbook policies and distribution.
- Spin-off analyses--e.g., cultural contents in Mandarin reading curricula materials (Wu); Numeracy curricula in Latin America (Valverde/ Romero); Diglossia issues in Arabic speaking countries (Kanaan)
- New research into underlying dimensions of textbooks in mathematics and reading: child centeredness, gender parity, cultural contents
- What is impact of textbook structures on educational outcomes like repetition, dropout and completion

Thank You!

Dr. Benavot's email: abenavot@hiroshima-u.ac.jp

Copy of report:
http://steinhardt.nyu.edu/scmsAdmin/media/users/jnw216/HMSS/BENAVOT_UIS_Curriculum_Report_for_NYU__Nov17_2011_.pdf

web sites:
ICATA: www.albany.edu/eaps/icata/
UIS: www.uis.unesco.org/