



CIES 2024 March 6-7 and 10-14

**Do Late Entry and Grade Repetition Help to
Improve Academic Achievement?
Evidence from Malawi, Ghana, and Uganda**

**Kyoko Taniguchi
Hiroshima University**

Background

- Students in primary school often have unofficial ages at each grade in sub-Saharan Africa because of late school entry and grade repetition.
- Late entry tended to cause delayed cognitive and non-cognitive development, grade repetition (Taniguchi, 2015), and early dropout (Taniguchi, 2017; Hirakawa & Taniguchi, 2021).
- Grade repetition is common in some countries; many students repeat a grade. It is considered a remedial for academic achievement (Hungu, 2010).



Do late entry and grade repetition help to improve academic achievement?

Research objective

The study investigated the effect of late entry and grade repetition on academic achievement in primary school by drawing data from Malawi, Ghana, and Uganda.

Common practice of late entry in sub-Saharan Africa

- Children entering school late is widespread in sub-Saharan Africa (Taniguchi, 2015).
- Children entering school late are from disadvantaged families (Nonoyama et al., 2010).
- Children enter primary school late for several reasons, such as unmatured bodies, unprepared school materials, and long distances to school (Taniguchi, 2017).

Common understanding in grade repetition in sub-Saharan Africa

- Grade repetition is often considered **a remedy for low academic achievement**, based on the idea that automatic promotion would disadvantage low-achieving students (Hungu, 2010).
- **Many developing countries, however, do not impose standard criteria for compelling grade repetition.** In general, a class teacher decides who will repeat based on comparison of test results: Those with poor performance on end-of-term testing may be asked to repeat a grade. Many teachers in developing countries have not had training for making such decisions and so use arbitrary criteria (Brophy, 2006). As a result, repeating students achieved as much as those who did not repeat a grade in some schools, but in other schools repeating students did not reach the same levels of achievement as those who did not repeat (Ikeda, 2005).
- The effect of grade repetition on academic achievement is mixed in both developed and developing countries. Many researchers have reported **negative achievement effects** when the children who have repeated grades are promoted to the next grade, and a few studies found **a short-term positive effect** of repeating that decreased and finally disappeared in later grades (Jimerson, 1999).

Methodology

Research tools

- Achievement test
- Questionnaire

Research country

- Malawi (Low)
- Ghana (Intermediate)
- Uganda (High)

Achievement test

Measured skills: Curriculum attainment from grades 1 to 6

- Measurement of foundational ability in English and mathematics, aligned with the national curriculum standards

Measurement level: Ability levels categorized as low, intermediate, and high

Target grade level: Grades 5 and 6

The framework of achievement test

English test

Type	Cognitive domain	Length of reading
Explanation/ Story	Use context and simple sentence structure to match words (Who/Where/What/How)	One sentence - Seven paragraphs
	Use context and simple sentence structure to match sentences (What/How/Why)	
	Interpret sentences to match words and phrases (What/How/Why)	
	Explain a core of story (What)	

- Answer: Multiple choice questions with four options
- Time: 90 minuities

Mathematics test

Topic	Cognitive domain
Number	Count numbers
	Understand digit (Three digits: Ones, Tens, Hundreds, Thousand, and Ten Thousand)
	Understand the size of number
Addition	Add two-digit/six-digit number and two-digit/six-digit number without carrying
	Add two-digit/six-digit number and two-digit/six-digit number with carrying
	Add two-digit/six-digit number and two-digit/six-digit number with carrying, including 0
Subtraction	Subtract from two-digit/six-digit number to two-digit/six-digit number without borrowing
	Subtract from two-digit/six-digit number to two-digit/six-digit number with borrowing
	Subtract from two-digit/six-digit number to two-digit/six-digit number with borrowing, including 0
Multiplication	Multiply one-digit/four-digit number by one-digit/four-digit number without carrying
	Multiply one-digit/four-digit number by one-digit/four-digit number with carrying
	Multiply one-digit/four-digit number by one-digit/four-digit number with carrying, including 0
Division	Divide one-digit/five-digit number by one-digit/two-digit number, and get one-digit/four-digit number
	Divide one-digit/five-digit number by one-digit/two-digit number, and get one-digit/four-digit number, including 0
Word problem	Add three-digit/six-digit number and three-digit/six-digit number without carrying
	Subtract from three-digit/six-digit number to three-digit/six-digit number without borrowing
	Multiply two-digit/four-digit number by one-digit/two-digit number without carrying
	Divide two-digit/four-digit number by one-digit/two-digit number, and get one-digit/three-digit number
Fraction	Understand the meaning of fraction and equivalent fraction
	Add fraction of the same and different denominators
	Subtract fraction of the same and different denominators
Decimal	Change the fraction into decimal
	Change the decimal into fraction
Pattern	Understand rule of number
Algebra	Understand algebra
Measurement	Understand unit
	Convert unit
	Understand perimeter
Geometry	Understand figures
	Understand symmetry
Graph	Read picture and tally graphs

How to develop test

1. Analyze of national curriculum in each country

Malawi

Ghana

Uganda

Malawi Curriculum Framework

Grade 1-6 Mathematics

Strand 1: NUMBER

Sub-strand 1.1: Counting, Representation & Cardinality

CONTENT STANDARDS

INDICATORS AND EXAMPLES

SUBJECT SPECIFIC PRACTICES AND CORE COMPETENCIES

Competences

Content

Suggested Activities

Ghana Curriculum Framework

Grade 1-6 Mathematics

Strand 1: NUMBER

Sub-strand 1.1: Counting, Representation & Cardinality

CONTENT STANDARDS

INDICATORS AND EXAMPLES

SUBJECT SPECIFIC PRACTICES AND CORE COMPETENCIES

Competences

Content

Suggested Activities

Uganda Curriculum Framework

Grade 1-6 Mathematics

Strand 1: NUMBER

Sub-strand 1.1: Counting, Representation & Cardinality

CONTENT STANDARDS

INDICATORS AND EXAMPLES

SUBJECT SPECIFIC PRACTICES AND CORE COMPETENCIES

Competences

Content

Suggested Activities

2. Develop common curriculum

Malawi	Uganda	Obitu
Grade 1: alphabet letters	alphabet letters	Pre-reading activities
Grade 2: Read 15 key words	Read 25 key words related to people, animals, objects and colours	Introduction to formal reading
Grade 3: Read a text of 200-300 words	Read short passages/stories containing descriptions of people, animals and objects and answer questions/choose to picture/ fill-in table	Recognition of words
Grade 4: Read a text of 500-1200 words	Read short paragraphs and sentences and tick the main details	Introduction to reading
Grade 5: Read a text of 1200-3000 words	Read 2-3 short paragraphs to find the main idea/ particular information/ facts	Reading aloud, Silent reading
Grade 6: Read a text of 3000-6000 words	Read a passage containing 4-5 paragraphs to find the main message/ information and report them orally or in writing	Reading silently meaning of text and answering questions on text read

3. Create question items

English: 97 question items
Mathematics: 110 question items

4. Create two test forms: Test A and Test B



5. Implement tests in each country (1st cycle)

Between 2021 and 2022

6. Analyze data (1st cycle)

Today's presentation

The level and characteristics of the test items are to some extent intentional

7. Implement tests in each country (2nd cycle)

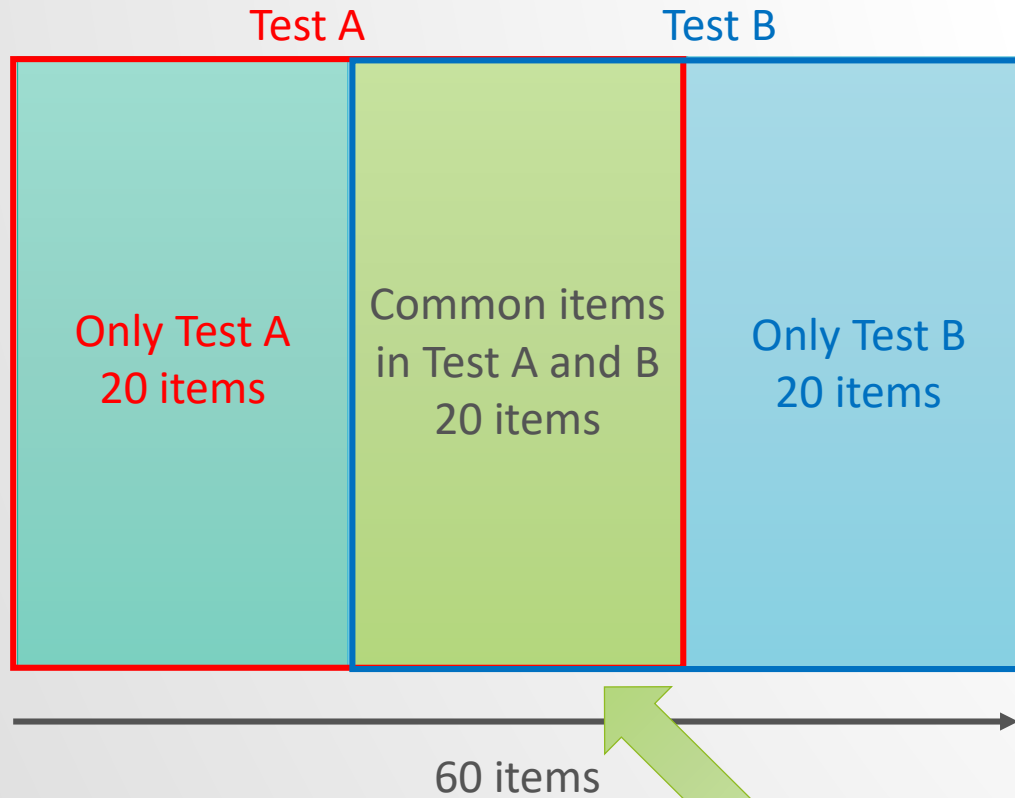
Between 2022 and 2023

8. Analyze data (2nd cycle)

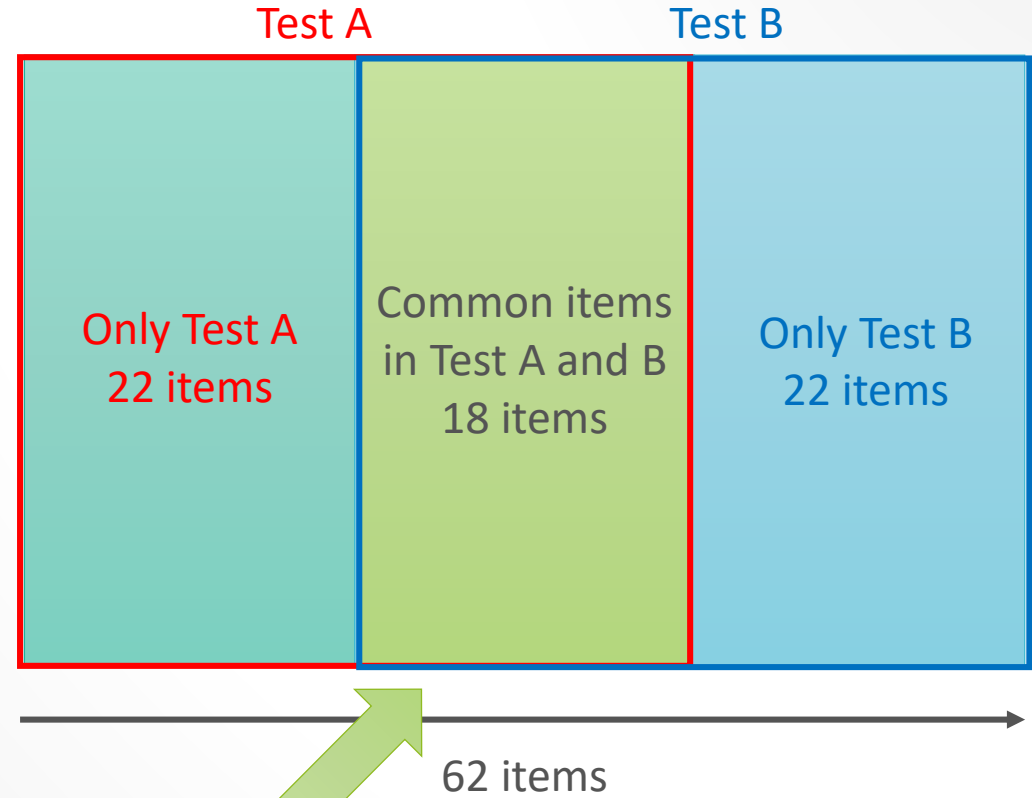
Compared to the first iteration, there are not significant changes in the item difficulty and item discrimination in the question items.

Develop two types of tests

English test



Mathematics test



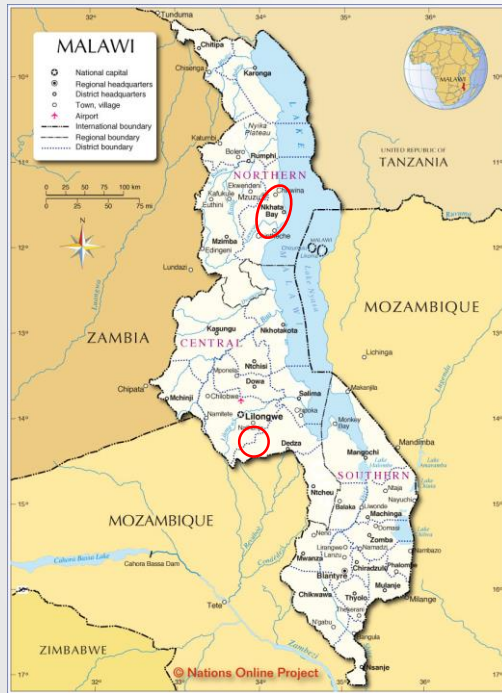
Common question items were included to ensure that Test A and Test B are designed to be comparable

Questionnaire

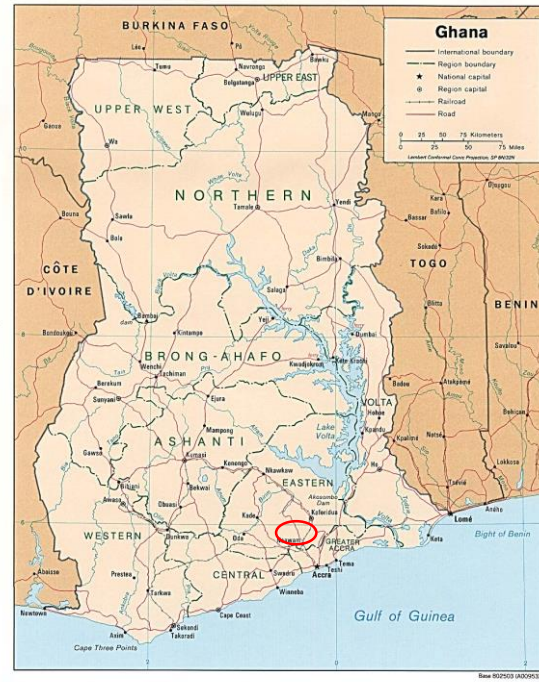
- Gender
- Age
- Number of siblings
- Number of absent days during last week
- Language at home
- Feelings to school
- Feelings to English and mathematics
- Number of grade repetition

Sample

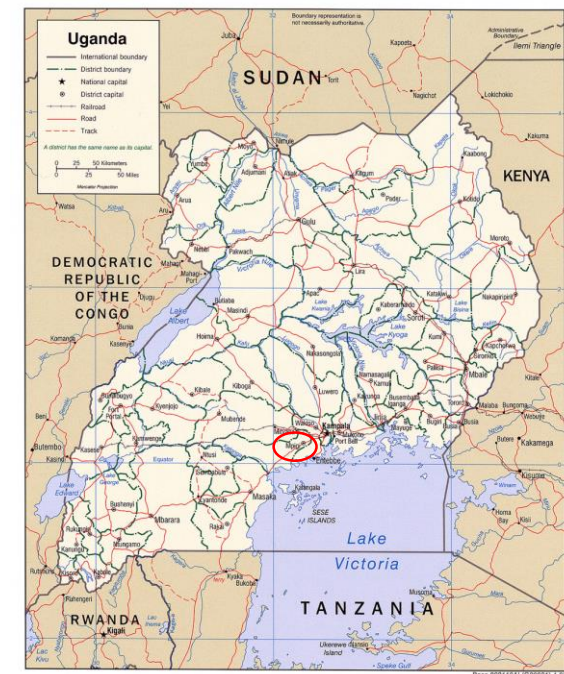
Malawi



Ghana



Uganda



Research area
Lilongwe rural east/
Nkhata Bay District

Sample
12 public schools
• 900 grade 5
• 636 grade 6

Fieldwork
October – November,
2021 (1st term)

Lower Manya Krobo Municipal,
Eastern Region

23 public schools
• 919 grade 5
• 981 grade 6

January – February, 2022 (1st
term)

Mpigi District

18 public schools
• 1049 grade 5
• 966 grade 6

May – June, 2022 (2nd
term)

Analysis

- Item response theory (IRT)

- To equate the ability scales of test takers for Test A and Test B, concurrent calibration, a method described by Kolen and Brennan (2014, p.182), was employed.

- The analysis assumed a two-parameter logistic model and utilized a multi-group IRT model, assuming separate ability value distributions for each grade in the three countries.

- $$p_j(\theta_i) = \frac{1}{1 + \exp[-1.7a_j(\theta_i - b_j)]}$$

$j = \text{item}$
$i = \text{examiner}$
$\theta = \text{ability of examiner}$
$a_j = \text{item discrimination parameter}$
$b_j = \text{item difficulty parameter}$

- Ghana's grade 5: Reference group, Estimated parameters: mean = 0 and SD = 1. Then, parameters was standardized by mean = 500 and SD =100.

- Descriptive statistics

- ANOVA

Test Reliability

Cronbach α

English test

- Test A : $\alpha = 0.926$
- Test B : $\alpha = 0.917$

Mathematics test

- Test A : $\alpha = 0.837$
- Test B : $\alpha = 0.852$



Created tests were reliable.

Age at the first entry of school

		Malawi		Ghana		Uganda	
		N	%	N	%	N	%
Grade 5	Early entry (Below 5 years old)	88	9.83	189	20.57	52	4.96
	Proper entry (Between 6 and 8 years old)	642	71.73	517	56.26	718	68.51
	Late entry (Above 9 years old)	165	18.44	213	23.18	278	26.53
	Total	895	100.00	919	100.01	1048	100.00
Grade 6	Early entry (Below 5 years old)	57	9.02	123	12.55	41	4.25
	Proper entry (Between 6 and 8 years old)	513	81.17	607	61.94	705	73.06
	Late entry (Above 9 years old)	62	9.81	250	25.51	219	22.69
	Total	632	100.00	980	100.00	965	100.00

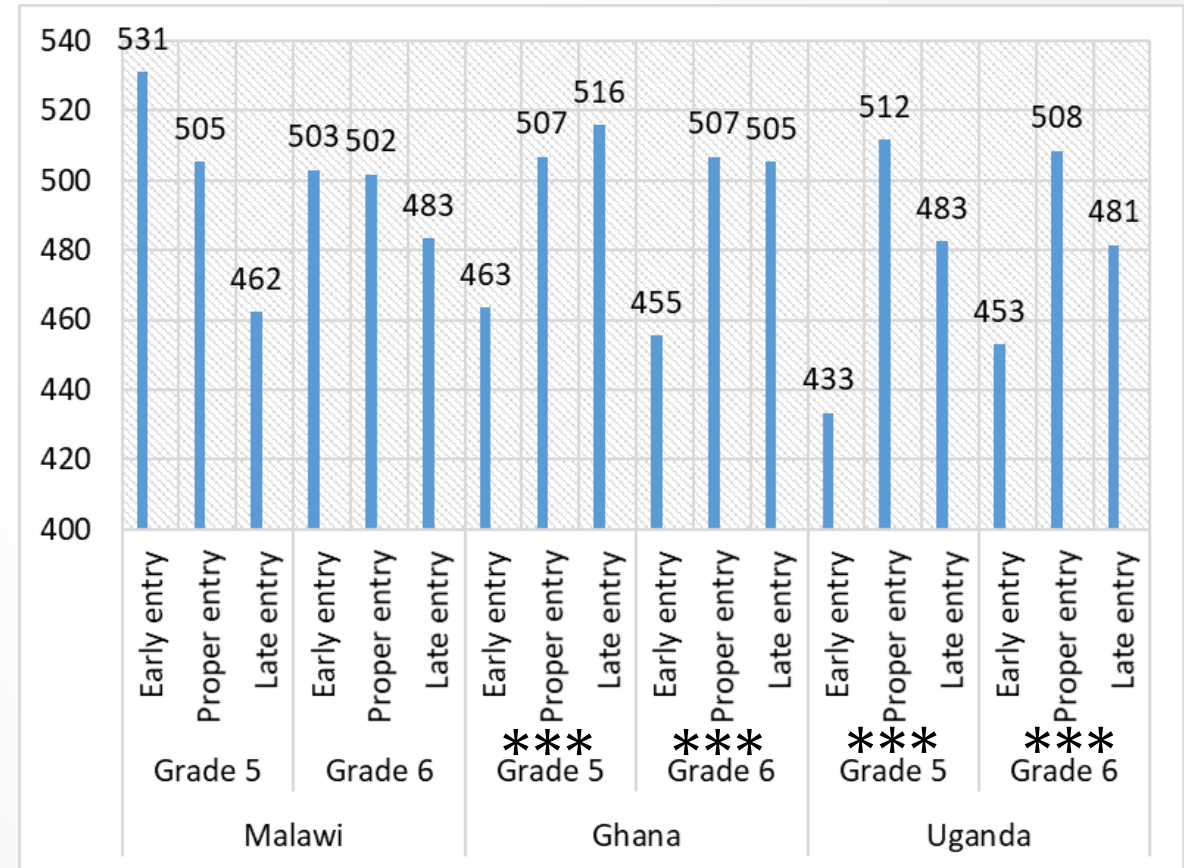
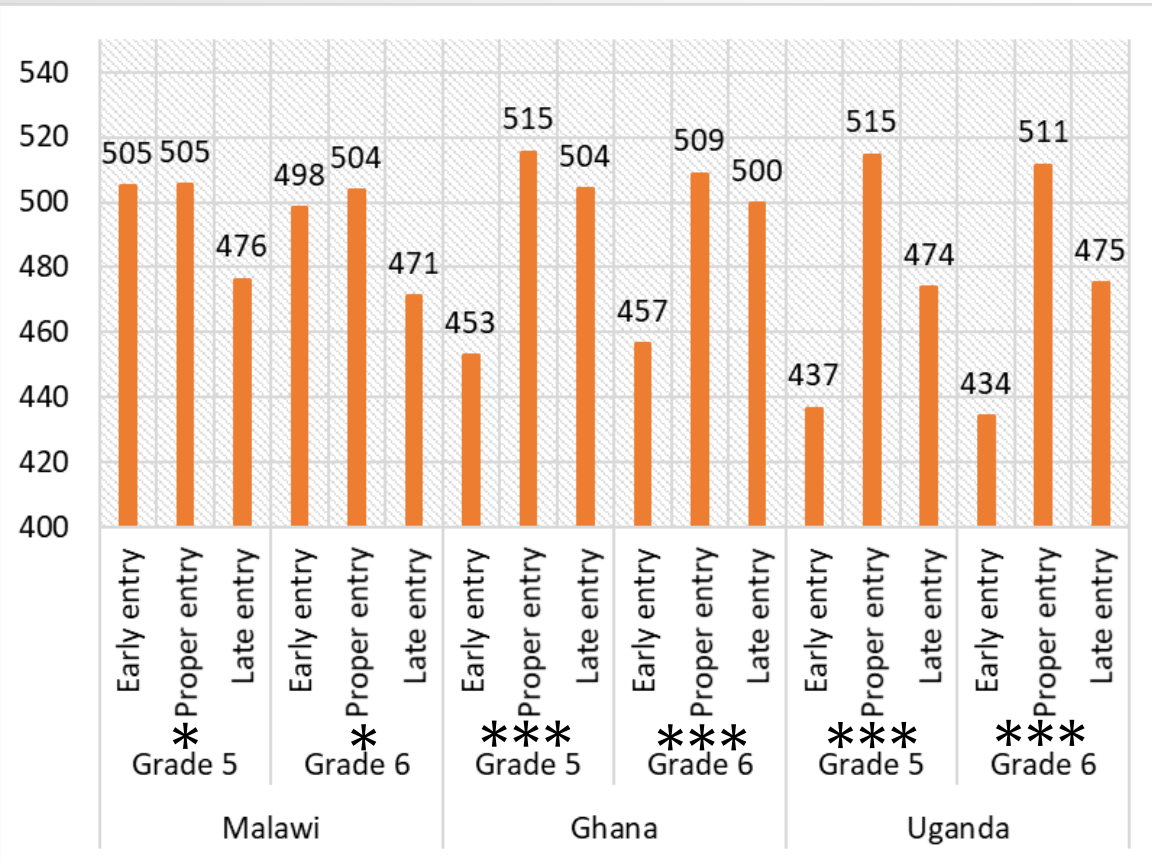
Number of grade repetition

Number of repetitions	Malawi				Ghana				Uganda			
	Grade 5		Grade 6		Grade 5		Grade 6		Grade 5		Grade 6	
	N	%	N	%	N	%	N	%	N	%	N	%
Never	250	27.78	148	23.27	568	61.81	686	69.93	672	64.06	669	69.25
Once	357	39.67	253	39.78	117	12.73	167	17.02	263	25.07	225	23.29
Twice	203	22.56	162	25.47	52	5.66	27	2.75	69	6.58	45	4.66
Three times or more	90	10.00	73	11.48	182	19.80	101	10.30	45	4.29	27	2.80
Total	900	100.00	636	100.00	919	100.00	981	100.00	1,049	100.00	966	100.00

The difference in achievement by age at first entry

English achievement

Mathematics achievement



Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

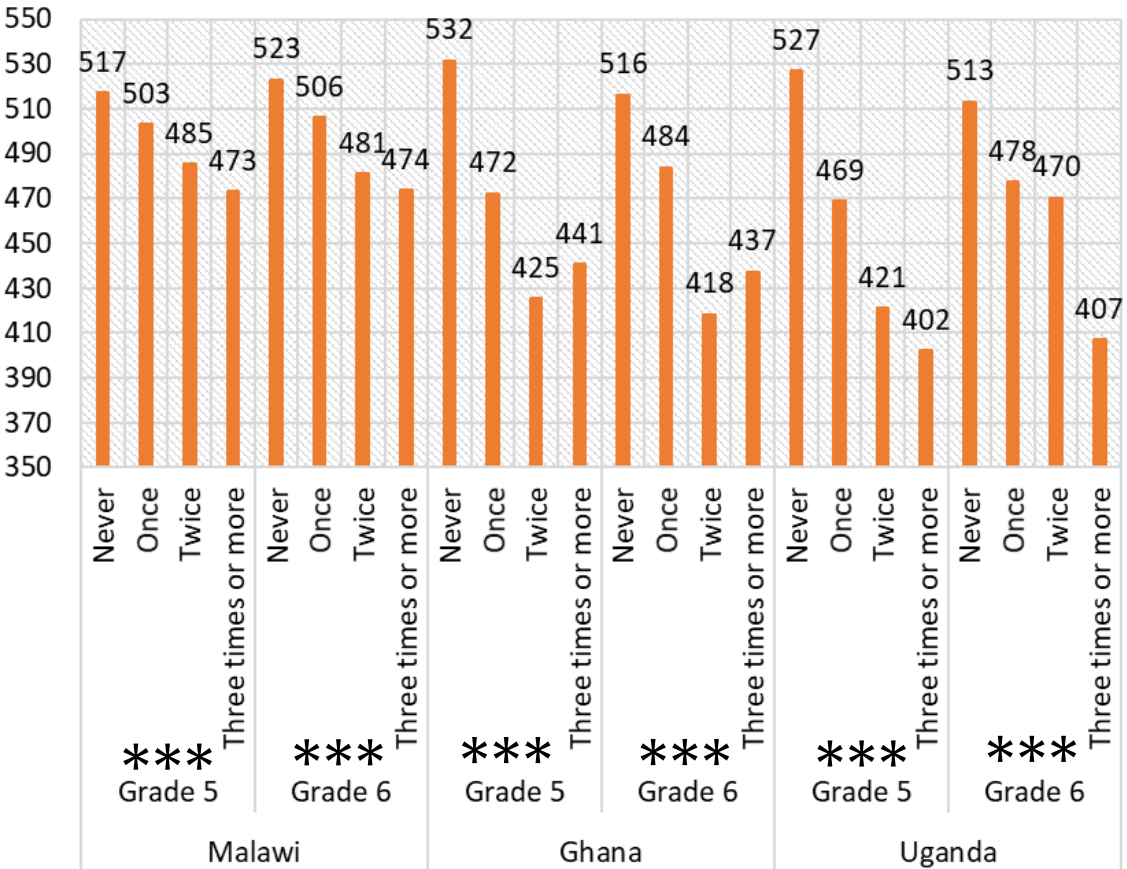
Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Children with entering primary school at proper age tended to have higher achievement than those with entering primary school at early and late ages in all countries. Interestingly, children with entering primary school at early age had lower achievement than those with entering at late age in Ghana and Uganda. Early entry is also a risk to produce low achievement.

There were significantly different in mathematics achievement among age at first entry in Ghana and Uganda. Children with entering primary school at proper age tended to have higher achievement than those with entering primary school at early and late ages in Uganda, while only at early age in Ghana.

The difference in achievement by number of grade repetitions

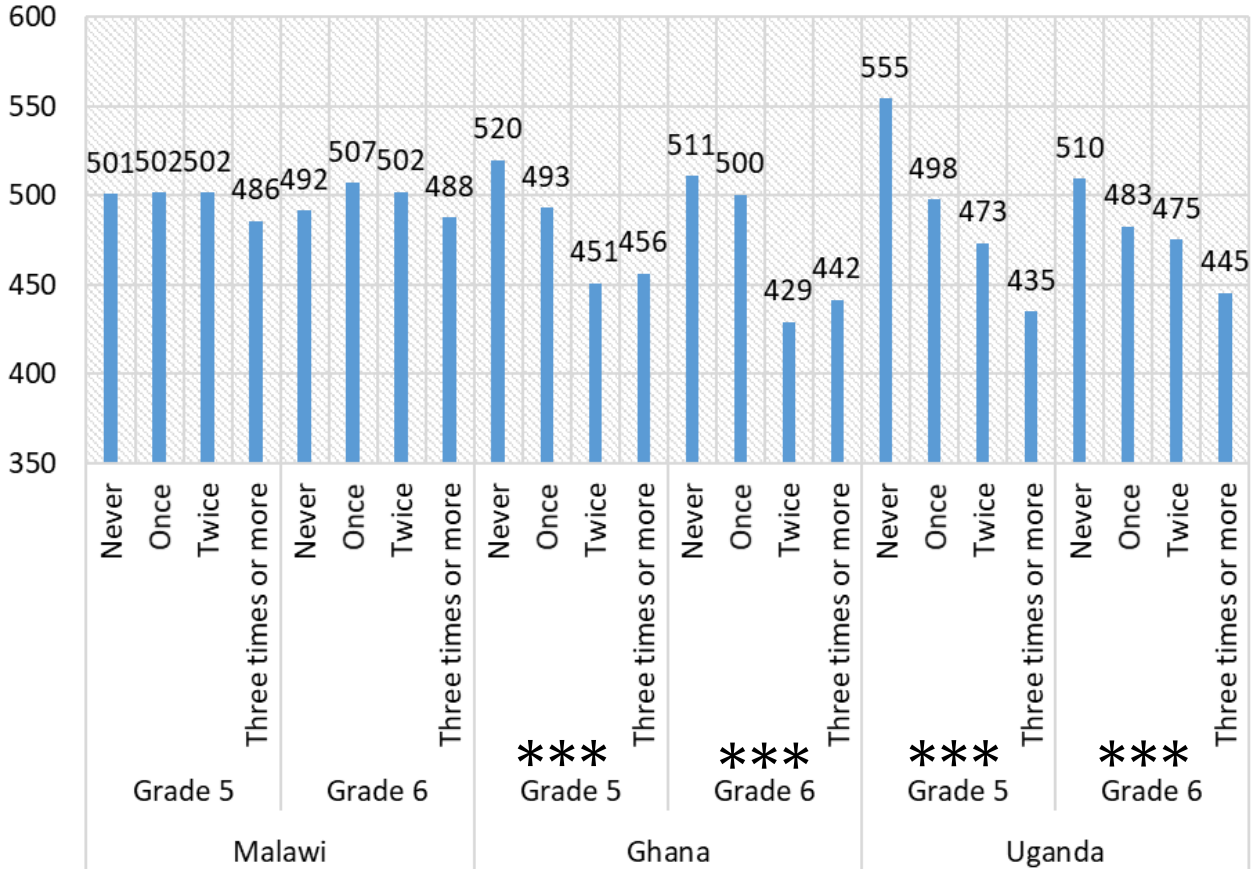
English achievement



Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

- English achievement was significantly decreased as increasing number of grade repetitions in all countries.

Mathematics achievement



Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

- Mathematics achievement was significantly decreased as increasing number of grade repetitions in Ghana and Uganda, except for Malawi.

Discussion

- Early and late entries did not always support improving student achievement.
 - Proper age entry is significant.

- Grade repetition did not always support improving student achievement.
 - Students need to acquire academic achievement in each grade.
 - Teachers should pay more attention to repeaters to improve their achievement.

Thank you for your attention!

Questions and comments are welcome.

Kyoko Taniguchi: tanikyo@hiroshima-u.ac.jp

Acknowledgments:

This research was supported by the Grant-in-Aid for Scientific Research (JSPS KAKENHI) under Grant No. 19H01626.