

**Nationwide Study of Early Grade
Reading and Mathematics Assessment
in the Republic of Macedonia
Short Version of Study Report**

This report is also available in Macedonian, Albanian and Turkish language

February 2017

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1. INTRODUCTION

In May 2016, the USAID Readers are Leaders Project implemented by the Foundation for Education and Cultural Initiatives “Step by Step” - Macedonia in partnership with the education institutions conducted the first nationwide assessment with the Early Grade Reading Assessment (EGRA) and the Early Grade Mathematics Assessment (EGMA) instruments of around 8,000 students (in each instrument) at the end of Grade 2 and Grade 3 from all 336 public primary schools in Macedonian, Albanian and Turkish language of instruction. The early grade assessment results provide critically important information for opening a policy dialogue in order to inform education stakeholders of the current status of students’ performance and establishing reading and math performance standards based on national average scores.

USAID’s Readers are Leaders Project is designed to improve early-grade student reading and numeracy skills, strengthen teachers’ pedagogical skills, especially diagnostic and formative assessment skills, and increase overall community recognition of the value of reading and numeracy skills for students’ intellectual growth.

The project adjusted two international assessment instruments to the local context, EGRA and EGMA, which measure how well students are learning basic reading and mathematics skills at the end of second and third grade, to identify the bottlenecks in acquiring these skills and subsequently to help developing intervention in reading and mathematics improvement.

EGRA and EGMA instruments were piloted in December 2013 with 1,762 assessments of Grade 3 and Grade 4 students from 22 primary schools in both Macedonian and Albanian languages of instruction. The first round of baseline data were collected through 3,895 assessments of Grade 2 and Grade 3 from May 19 to June 3, 2014 in 42 primary schools.

More information on the background of localizing EGRA and EGMA instruments and their administration in schools to measure student reading and math performance at the end of Grade 2 and 3 is available in the Baseline study report, available in Macedonian and English on http://www.stepbystep.org.mk/WEBprostor/RAL_Baseline_report_September_2014.pdf and in the Study Report from May 2015 available in Macedonian, Albanian and English on http://www.stepbystep.org.mk/WEBprostor/EGRA_and_EGMA_Study_Report_-_May_2015.pdf.

The objectives of the first nationwide study with EGRA and EGMA conducted in May 2016 were twofold:

1. to collect baseline performance data in reading and math on a sample of 4,000 Grade 2 and 4,000 Grade 3 students from 336 primary schools studying in Macedonian, Albanian and Turkish language of instruction;
2. to collect progress data on reading and math performance of Grade 4 students first tested with EGRA and EGMA in May 2014. The longitudinal assessment of these students for four years in a row (2014 – 2017), until the end of their early-grade primary education will help us monitor their performance as they study in schools that have been involved in project activities since the very beginning and have benefited from several years of improved teaching and access to appropriate reading materials.

The national results for Grade 2 and 3 students, as well as the longitudinal results of Grade 4 and 5 students (to be assessed in 2017) will help us draft reading and math benchmarks, which will be based on national average scores.

1.1 Population and sample design

The target population for the first nation-wide study with EGRA and EGMA was defined as all students in Grade 2 and 3 in Macedonian, Albanian and Turkish language of instruction. The school pedagogues sent a list of their students, making it possible for the project to have a list of all the schoolchildren in the country, so that students could be selected randomly from this national listing. According to the available data, the population was consisted of 20,704 students in Grade 2 and 20,341 students in Grade 3.

It was predefined total of 8,000 students to take part in the nationwide study (4,000 in Grade 2 and 4,000 in Grade 3). Using enrollment data from the schools, a sample of students was selected using a stratified random design with proportional allocation based on the region, school location, language of instruction and school size to ensure all regions would have a probability of selection equal to their actual distribution in the country.

The schools were divided into three strata according to the language of instruction (Macedonian, Albanian and Turkish). The bi- and three- lingual schools were considered as separate schools. In order for the sample of students to reflect as close as possible the features of selected schools, first the ratio between Macedonian, Albanian and Turkish students was determined. Then based on the number of students in Grade 2 and Grade 3, schools were divided into small, medium and large schools to calculate the number of students to be selected in each group.

In order to protect the anonymity, each selected student in the sample received a unique code comprised of: unique number of the school, language in which the test would be administered (Macedonian, Albanian or Turkish), number of the class and student's number in the registry.

From the selected number of students for participation in the study (4,017 in Grade 2 and 4,171 in Grade 3), the number of assessed students totaled to 3,678 in Grade 2 and 3,818 in Grade 3. The attrition in Grade 2 was 6.2%, while in Grade 3 was 8.5%. The main reason for attrition was long-term absence of the students due to illness or relocation of student's family in a foreign country.

Additionally, longitudinal data were collected from the sample of Grade 4 students (for a third year in a row) from the initial 42 schools. The baseline data for this cohort of students was collected as part of the baseline study conducted in May 2014, when the students were in Grade 2.

Table 1. Number of assessed students in the baseline sample per grade, gender and language of instruction

Grade	Grade 2		Grade 3		Longitudinal Grade 4	
	M	F	M	F	M	F
Language of instruction						
Macedonian	1,258	1,184	1,265	1,183	185	187
Albanian	602	571	660	550	61	73
Turkish	63	90	80	80		
Subtotal	1,923	1,845	2,005	1,813	246	260
Total	3,768		3,818		506	

1.2 Instrument structure

One EGRA instrument was developed for both grades in Macedonian, Albanian and in Turkish language, consisted of the following components:

- Task 1 - Letter knowledge (100 letter combinations)
- Task 2 - Familiar word reading (50 words)
- Task 3 and 5 - Reading fluency (story of around 100 to 200 words)
- Task 4 and 6 - Reading comprehension (10 comprehension questions for each story).

All tasks were timed to one minute. Timing of EGRA tasks is very important, as students achieve automaticity on the mechanics of reading. “Automaticity” means fluency in word recognition so that the reader is no longer aware of or needs to concentrate on the mental effort of translating letters to sounds and forming sounds into words. At that point, the reader is decoding quickly enough to be able to focus on comprehension.

Early Grade Mathematics Assessment (EGMA) is consisted of seven tasks:

- Task 1 - number comparison
- Task 2 - missing number (number patterns)
- Task 3 - addition
- Task 4 – subtraction
- Task 5 - word problems
- Task 6 - shape recognition
- Task 7 - pattern extension.

Counters or manipulatives as well as paper and pencil were provided to students for doing the necessary calculations. The children were also allowed to use their fingers. After each task, the assessor was asked to record the type of strategy used by the student.

For all EGRA and EGMA tasks, a practice item was introduced, so students could easily understand what was required of them and the feedback provided by the assessors could tell them whether they were on the right track.

In order to reduce the time taken to complete the assessment, and to relieve the stress children might feel in trying to perform a task unsuccessfully for an indefinite period of time EGMA tasks were also timed, but in this case for two minutes. To ensure that children do not get fatigued or overwhelmed and to learn of their ability for each of the tasks, a universal stop rule has been also put in place. The rule was: If a student gets the first four items incorrect, one after the other, the assessor should stop the student and move on to the next task. However, each task must be attempted.

Also following background information about students was collected during EGRA administration:

- Type of the school the student attends (central or satellite);
- Type of classroom (monograde or multigrade);
- Grade of the student (second or third);
- Gender of the student (male or female);
- Language of instruction (Macedonian, Albanian or Turkish);
- Education of the mother/ guardian (primary or less, secondary or higher and more);
- Education of the father/ guardian (primary or less, secondary or higher and more)

- Age of the student;
- Language spoken at home (Macedonian, Albanian, Turkish, Romani, Serbian or other language): in this question it was possible to mark two and more options for students from multilingual families;
- Attendance of preschool;
- Availability of additional books at home;
- Reading before starting school;
- Borrowing books from library;
- Habit of reading independently or together with family members (mother, father, both parents, siblings, grandparents, someone else).

This section of the instrument was also used to start conversation with the students and establish rapport, which is an important task in oral, one-on-one assessments.

The EGRA and EGMA tasks in three languages are available in the corresponding reports in Macedonian, Albanian and Turkish language.

1.3 Training for Administration of EGRA and EGMA Instruments

Assessors responsible for administration of EGRA and EGMA instruments in the schools have a substantial influence on the quality of any EGRA and EGMA implementation. School representatives (psychologists, pedagogues and early grade teachers) from each school were trained for administration of the instruments with the help of tablet computer. Assessors were trained in each language of instruction (Macedonian, Albanian and Turkish), whereas the number of trained assessors varied according to the number of students in each language in the school. The project trained total of 750 assessors from all primary schools in Macedonia.

1.4 Data collection, processing, analysis and reporting

Having in mind the large number of assessors and participation of all primary schools in this typically busy period for school communities, the time period for administration of EGRA and EGMA was extended from two to three weeks, and took place from May 9 to 31 which was sufficient even for the schools with both baseline and longitudinal samples.

The instruments were administered in 336 primary schools, or based on the language of instruction, in 265 schools with Macedonian, 134 with Albanian and 39 schools with Turkish language of instruction.

During data collection, it is important to ensure the quality of instruments being used and the data being collected. This is why 71 observers were deployed to monitor the data collection process and ensure that assessors follow the rules of EGRA/EGMA implementation.

The actual data processing was done by Beti Lameva, Head of the IT and State Matura Unit in the National Examinations Center.

The analysis and reporting of results from EGRA and EGMA present the student performance in reading and mathematics and examine differences by gender, language of instruction, location of school and education of parents.

2. EGRA & EGMA NATIONAL BASELINE FINDINGS

This section presents summary statistics for all tasks of the EGRA and EGMA national baseline assessment in Macedonia conducted in 336 primary schools.

2.1 Characteristics of Sample

Approximately 65% of the sampled students attended classes in Macedonian, 31% in Albanian and 4% in Turkish language of instruction. Majority of students (64%) are from urban areas, while 35% from rural. The sample is composed of an average of 52% male and 48% female students.

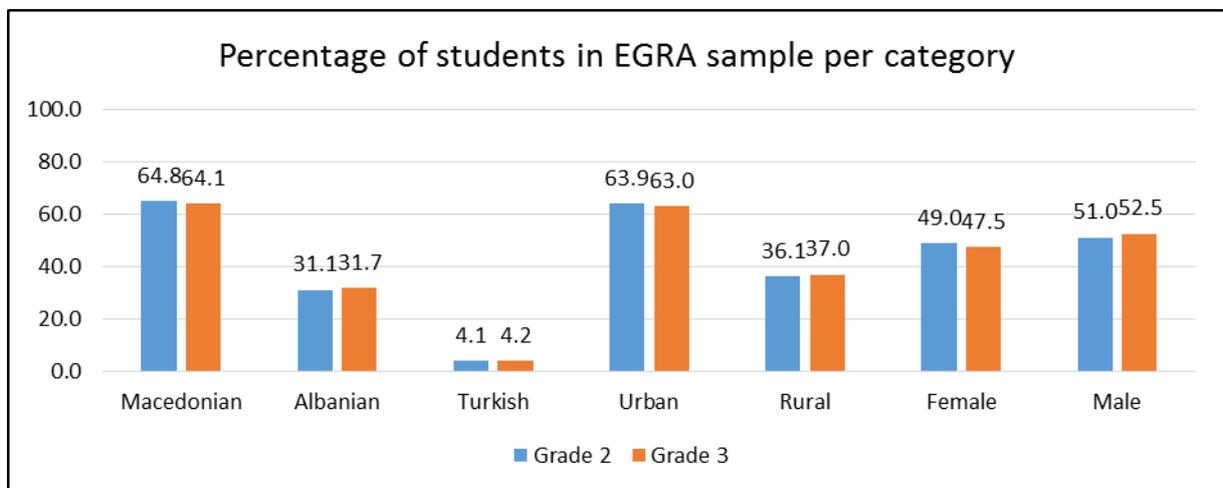


Figure 1. Percentage of students in EGRA sample per grade, language of instruction, location of the schools and gender

2.2 How Well Are Students Reading in Macedonian, Albanian and Turkish?

The average percentage of students that completed the EGRA test is based on the average P-value which is obtained by dividing the average test score by the maximum possible test score and multiplying this by 100.

The comparison of results in three languages, show that students achieved best results in the letter knowledge task (75.6% in Macedonian 79.6% in Albanian and 73.7% in Turkish language complete this task), while the poorest results are in reading comprehension (39.6% of students completed this task in Macedonian, 36.4% in Albanian and 21.2% in Turkish language).

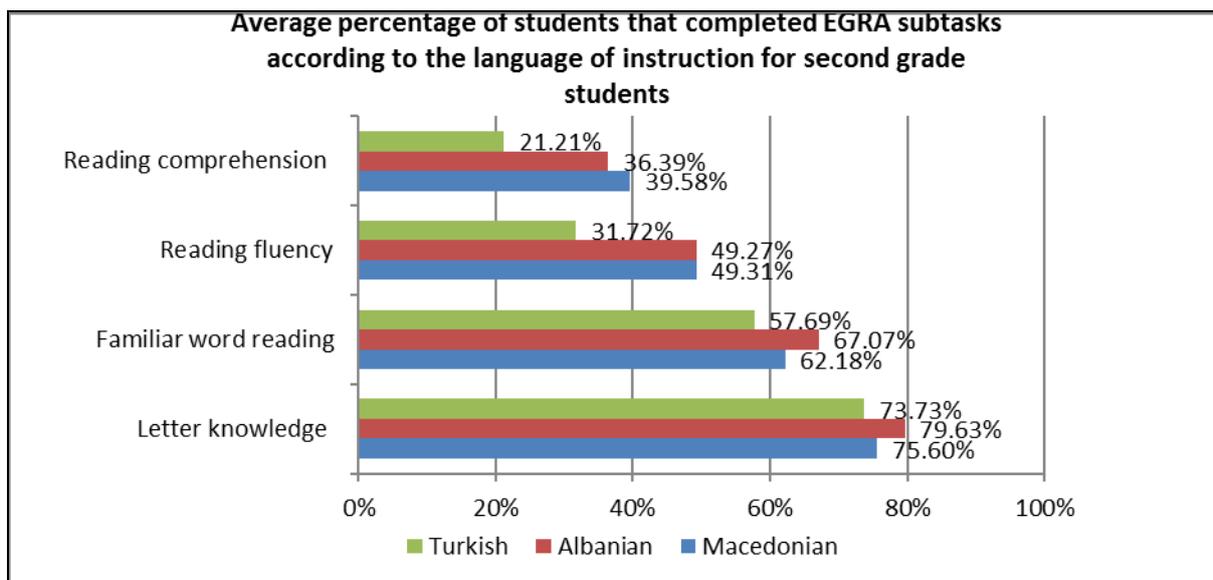


Figure 2. Average percentage of students that completed EGRA tasks for Grade 2

In Grade 3, as expected students have better results in all three languages, but again the best results are achieved in letter knowledge (83.6% in Macedonian, 87.4% in Albanian and 86.7 in Turkish language of instruction), followed by familiar word reading, reading fluency and the worst in reading comprehension (59% in Macedonian, 53% in Albanian and 38% in Turkish language).

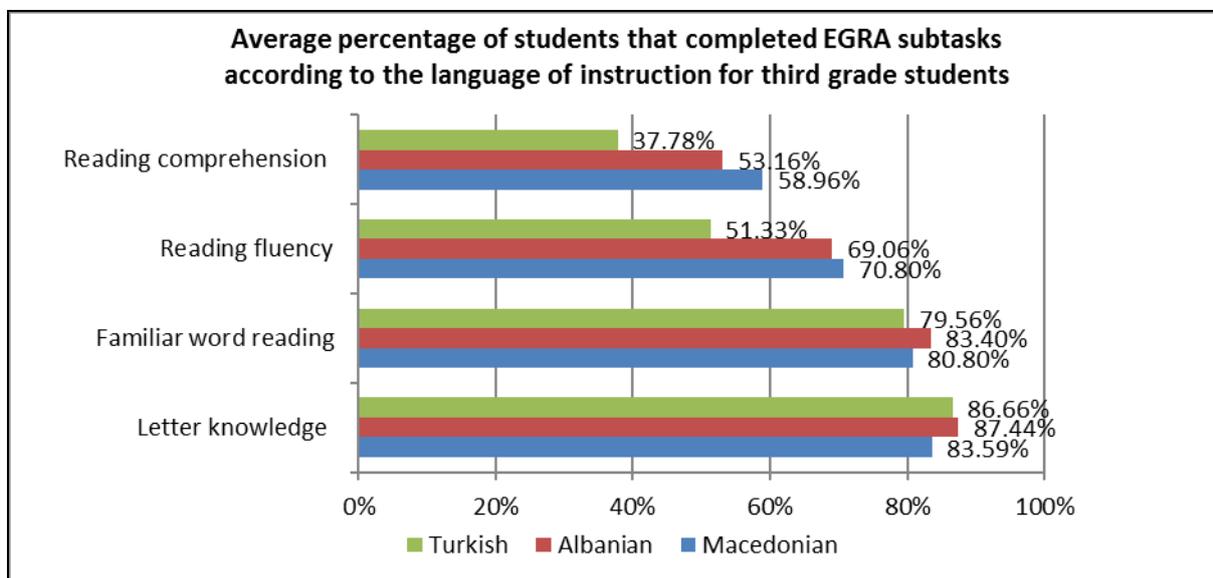


Figure 3. Average percentage of students that completed EGRA tasks for Grade 3

The breakdown of results per task (see Table 2) showed that students were performing well in naming letters in all three languages in both grades. The number of correctly read letters per minute varied from 77 clpm for Turkish language of instruction in Grade 2 to 96 clpm in Grade 3 for Albanian language of instruction.

In the task on reading familiar words in unconnected text, Grade 2 students have an average score between 31 and 37 cwpm, while in Grade 3 it is between 51 and 55 cwpm.

The reading fluency task showed that students had more variable average scores depending on the language of instruction. Students in Grade 2 read from 27 cwpm for Turkish, through 44 cwpm for Macedonian to 47 cwpm for Albanian language of instruction. In Grade 3, students read 47 cwpm for Turkish language, 68 for Macedonian to 70 for Albanian language of instruction. These results are concerning, because in order to reach 80% of 100% comprehension scores, oral reading fluency levels need to be somewhere between 50 and 80 cwpm¹. It implies that at that speed average students are reading fast enough to retain a text in working memory long enough to make sense out of it (about 60 for easier text, higher wpm for more complex text).

Table 2. Overall student results per task on EGRA instrument

Grade	Grade 2 (baseline)			Grade 3 (baseline)		
	Mac.	Alb.	Tur.	Mac.	Alb.	Tur.
Language of instruction N	2.442	1.173	153	2.448	1.210	160
Correct letters per minute	78	84	77	88	96	95
Correct familiar words per minute	34	37	31	51	55	54
Correct words per minute in a story	44	47	27	68	70	47
US oral reading fluency norms	(47 - 53)			(72 - 89)		
Reading comprehension	40%	35%	20%	60%	55%	40%
International benchmark	80%			80%		

The average comprehension score in Grade 2 ranges from 20% for Turkish, through 35% for Albanian to 40% for Macedonian language of instruction. In Grade 3, it ranges from 40% for Turkish, through 55% for Albanian to 60% for Macedonian language of instruction. The results suggest that the international benchmark of 80% of answered questions is not met by far in neither grade nor language, which is highly alarming.

There was positive correlation between oral reading fluency and reading comprehension scores which was statistically significant for all three languages of instruction in both grades, meaning that the increase of reading fluency will also increase the reading comprehension.

Several statistical methods were used to additionally test, how the oral reading fluency score and reading comprehension change depending on the following variables:

- Type of the school the student attends (central or satellite);
- Type of classroom (single or multigrade);
- Attendance of preschool;
- Availability of additional books at home;
- Reading before starting school;

¹ RTI (2010). "Early Literacy: Igniting education for all". RTI Publication.

- Borrowing books from library;
- Gender of the student;
- Education of parents/ guardians.

The results show that there is a statistically significant difference in the oral reading fluency scores across both grades and in all languages of instruction according to the education of parents, both mother and father.

According to the average reading fluency scores, students with Macedonian language of instruction performed better if had reading skills before starting school (Grade 2) or attended single classes in a central school and borrowed books from the library (Grade 3).

For the Albanian language of instruction, students could read significantly more correct words per minute if they attended multigrade classrooms and borrowed library books (Grade 2) or attended pre-school (Grade 3).

For the Turkish language of instruction, attendance of central school, the reading skills before starting school and borrowing library books have significantly increased reading fluency results in Grade 2, while availability of books at home in Grade 3.

Regarding the reading comprehension, students with Macedonian language of instruction in both grades that attended pre-school, had books at home and borrowed library books had significantly better results in understanding the text.

For the Albanian language of instruction, students that did not attend pre-school, did not start reading before going to school, did not have available books at home and did not borrow library books had significantly lower reading comprehension score in both grades.

For the Turkish language of instruction, second graders that had no books at home had significantly poorer results, while for third graders those having books at home had significantly better results.

When we used regression analysis to look into the factors associated with student reading skills in both grades and all languages of instruction, it seems that the most relevant factors associated with developing reading fluency skills are the reading skills developed before going to school and availability of books at home. The books the students have at home are also highly associated with the reading comprehension.

2.3 How Well Are Students Doing Basic Mathematics?

Generally, number discrimination and geometric pattern extension are the tasks completed by most students (more than 90%), making them the easiest tasks in the instrument. The most difficult task is subtraction for both grades (54% in Grade 2 and 57% in Grade 3) followed by word problems (66% for Grade 2 and 3).

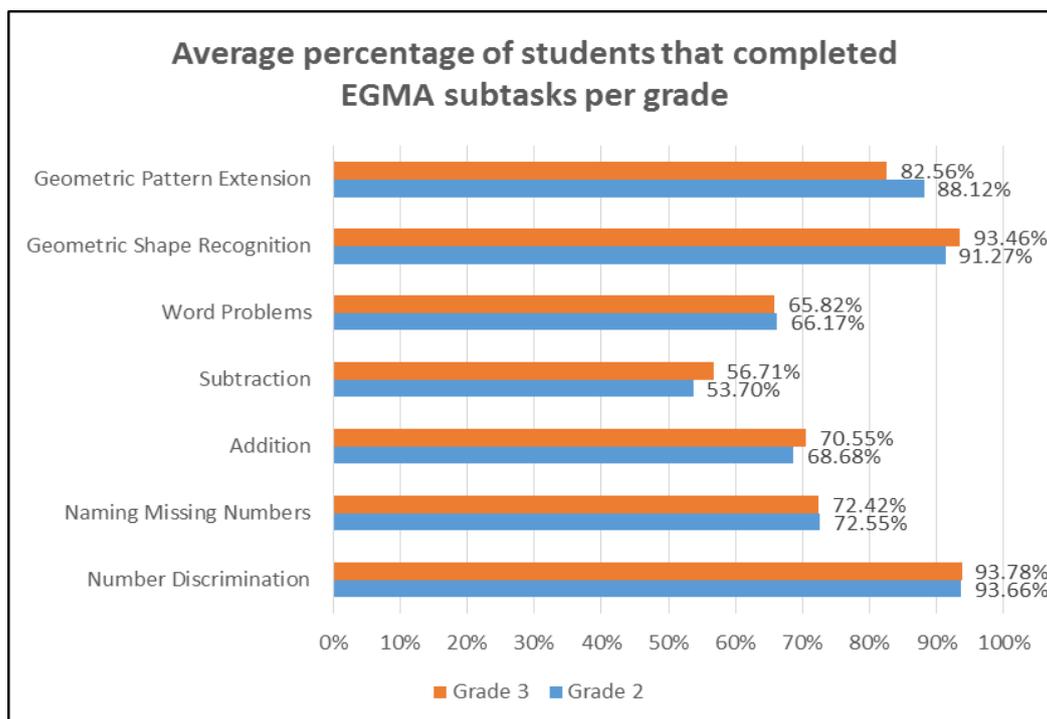


Figure 4. Average percentage of students that completed EGMA tasks

The number discrimination is the easiest task for the students in the instrument, as most of them complete it in both grades.

In the missing number task, on average, Grade 2 students have 4 correct items out of 5, while Grade 3 students 5 out of 7.

In the addition and subtraction tasks assessing student procedural competency in basic operations, students have much lower results.

Grade 2 students could add up correctly 4 out of 10 tasks, while Grade 3 students 5 out of 10. In subtraction, Grade 2 students could do correctly 3 out of 10 tasks, while Grade 3 students 4 out of 10.

In the word problem task, students from both grades could do correctly 2 to 3 out of 4 tasks.

Regarding the counting strategies used, mental calculation is dominant in both Grade 2 and 3. One third of Grade 2 and one fourth of Grade 3 students use fingers. The least frequent strategy is use of pencil and papers for Grade 2 students and use of manipulatives for Grade 3 students.

In the geometry area, students have good results both in shapes recognition and pattern extension.

Table 3. Overall student results per task on EGMA instrument

Grade	Grade 2	Grade 2
N	3,792	3,858
1. Number discrimination		
Number of items in task	7	10
Correct per minute	23	20
2. Missing numbers		
Number of items in task	5	7
Correct items	3.63	5.07
3. Addition		
Number of items in task	10	10
Correct per minute	4.25	5
4. Subtraction		
Number of items in task	10	10
Correct per minute	3	4
5. Word Problems		
Number of items in task	4	4
Correct items	2.65	2.63
6. Geometric Shapes Recognition		
Number of items in task	3	3
Correct items	2.74	2.48
7. Geometric Patterns Extension		
Number of items in task	3	3
Correct items	2.64	2,48

Main predictors of student success in math are:

- Higher education of parents
- Studying in central or urban schools and monograde classrooms
- Attendance of pre-school institution
- Having books at home

3. EGRA & EGMA LONGITUDINAL FINDINGS

Longitudinally, the average scores of students with both Macedonian and Albanian language of instruction on EGRA instrument increase as they progress from one grade to another. The best results are achieved in the letter knowledge task and worst in reading comprehension task.

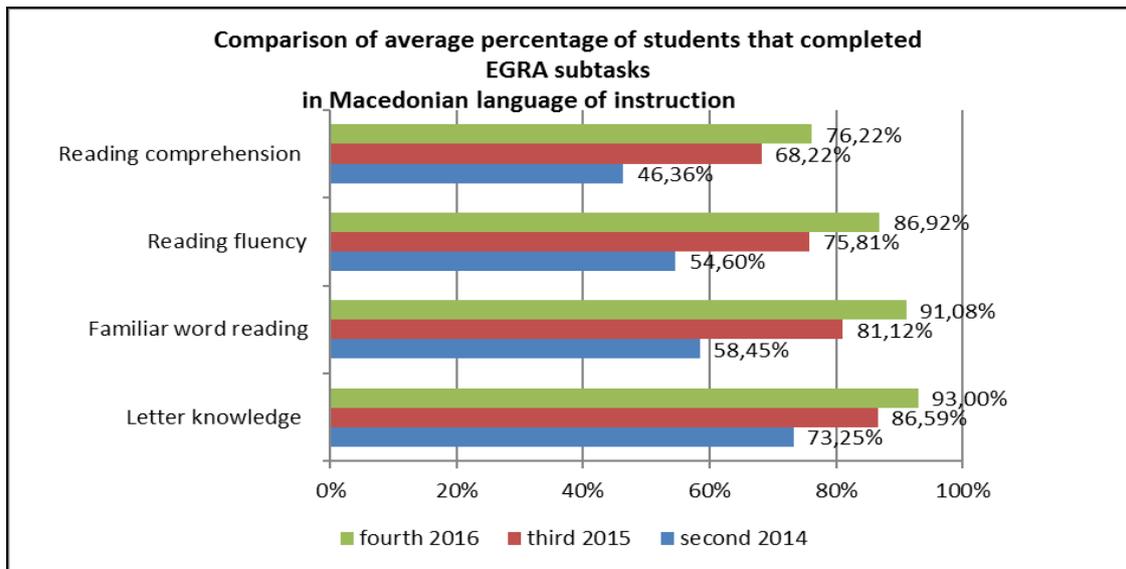


Figure 5. Comparison of average percentage of students that completed EGRA tasks in Macedonian language of instruction

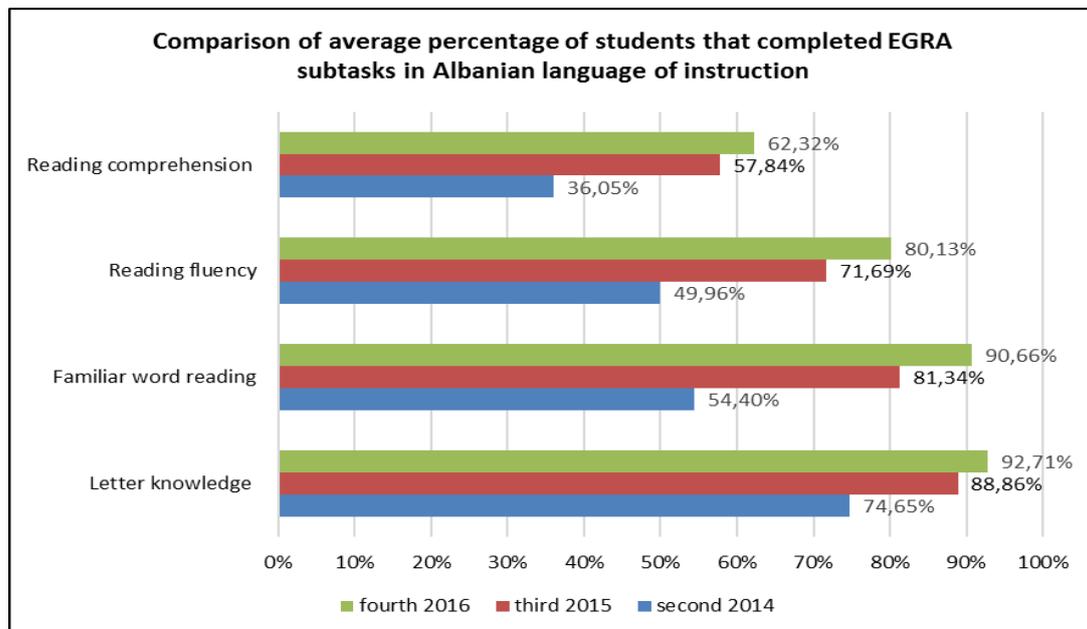


Figure 6. Comparison of average percentage of students that completed EGRA tasks in Albanian language of instruction

The comparison of results per task (see Table 3) showed that Grade 4 students are much faster readers compared with the time when they were Grade 2, reading 94 correct words per minute in Macedonian and 89 correct words per minute in Albanian language.

Table 4. Progress of student results per task and grade on EGRA instrument for longitudinal sample

Grade	Grade 2 (2014)		Grade 3 (2015)		Grade 4 (2016)	
	Mac. 731	Alb. 250	Mac. 692	Alb. 229	Mac. 372	Alb. 136
Language of instruction N						
Correct letters per minute	74	83	87	108	104	106
Correct familiar words per minute	31	30	49	53	69	68
Correct words per minute in a story	41	40	81	77	94	89
US oral reading fluency norms	(47 - 53)		(72 - 89)		(92 – 107)	
Reading comprehension	46%	37%	69%	58%	75%	62%
International benchmark	80%					

The reading comprehension has also significantly increased, from 46% in Grade 2 to 75% in Grade 4 for the Macedonian language and from 37% to 62% in Albanian language. However, even these results are still below the international standard of at least 80% comprehension.

In the area of mathematics, Grade 4 students had highest progress in doing word problems (54% in Grade 3 to 76% in Grade 4) and Geometric Shape Recognition (72% in Grade 3 to 95% in Grade 4). On the other hand, the results dropped in addition (from 87% in Grade 3 to 84% in Grade 4) and subtraction (72% in Grade 3 to 71% in Grade 4).

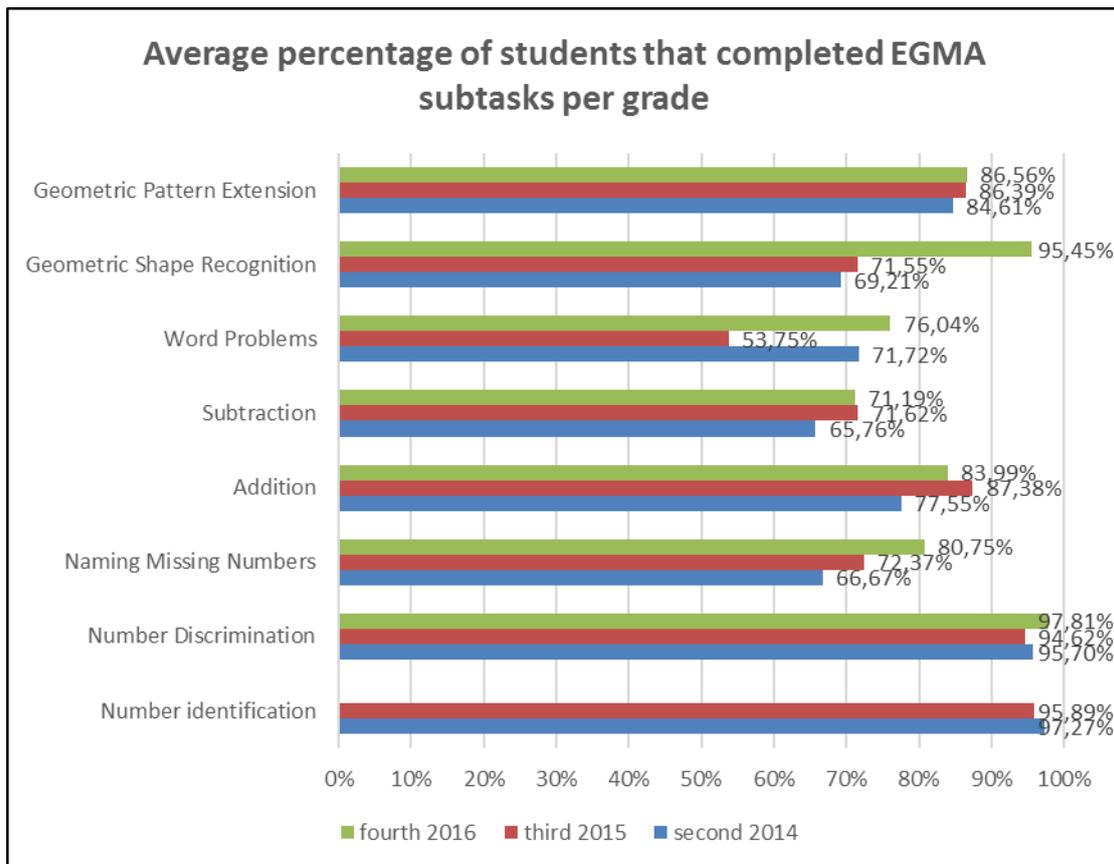


Figure 7. Comparison of average percentage of students that completed EGMA tasks

The strategy use showed that in Grade 4, students are more inclined to use mental calculations or paper and pencil instead of using fingers or counters.

The results in the geometry area, both shape recognition and pattern extension, are high.

4. LESSONS LEARNED FROM EGRA AND EGMA APPLICATION

The nationwide baseline results confirm the results from previous studies that the letter recognition skills of Grade 2 to 4 students are well developed, while their oral reading fluency and comprehension remain the bottleneck in our early grade education.

Most of the findings of our study confirm the research literature and theory in this area. However, some of the factors examined to be associated with the reading fluency and comprehension did not give straightforward connection in both grades and three languages of instruction.

Below average results in oral reading fluency and comprehension, particularly at the end of third grade, highlight multiple reasons why children may not acquire the necessary reading skills at school, such as:

- insufficient resources at school and home,
- insufficient learning time (e.g., during and/or after school),
- teachers/principals have little incentive to improve learning,

- rigid and overly ambitious curricula which do not match the learning levels of the students,
- teachers do not individualize instruction,
- low-performing students do not get extra help² (Floretta & Strathmann, 2016).

For the results in mathematics, having in mind that new curriculum in mathematics and sciences was introduced in Macedonia in September 2014, more time is required before teachers master the new curriculum, so that the student achievements could show whether this change is for the better.

However the dropping scores in the addition and subtraction tasks of Grade 4 students from the longitudinal sample is a worrying sign that children moved on learning other mathematical concepts before becoming skilled at doing the foundational operations. During the first assessment with EGRA and EGMA in May 2014, these students were second grade and they learned according to the old math curriculum, i.e. did addition and subtraction up to 20. In the next school year 2014/15, when the new math curriculum was introduced as third graders they continued to learn addition and subtraction up to 1,000, without practicing these two mathematical operations up to 100. Maybe this “leap” is one of the factors for deteriorating results in addition and subtraction.

The mental calculation or doing math problems by heart is a dominant strategy that students use in all assessed grades, preceding the use of fingers, paper and pencil or manipulatives. Although, manipulatives are used in some primary schools to support teaching and learning they are not used as effectively or as widely as they should be. The work of Swiss psychologist Jean Piaget suggested that children aged seven to ten years work in primarily concrete ways and that the abstract notions of mathematics may only be accessible to them through embodiment in practical resources. This is why the use of manipulatives should be central to the early development of mathematical ideas especially for children under the age of eleven.

5. IMPORTANT RECOMMENDATIONS FOR THE FUTURE

The results of the EGRA/EGMA indicate several critically important areas in which interventions will be needed:

On a school level:

- adjust the **timetable** so teachers could spend more time of the instruction on **shared and independent reading** as appropriate;
- organize **classroom reading corners or small libraries** and ensure that students have time to practice their new skills in reading to increase their fluency and accuracy;
- **tailor classes** based on the needs and results of their students;
- expose students to **different types of inferential questions** from an early age in order to be able to learn to express their own opinion, interpret facts or judgment and increase their comprehension skills;
- provide **workshops for parents** and other family members and share ideas and tips for engaging children in literacy activities in order to mitigate the effects of the lower

² Floretta, J., Neal, M. & Strathmann, L. (2016) Moving Beyond Inputs: Lessons from Models to Improve Early Grade Reading Outcomes in Developing Countries, Presentation for EGRA webinar, Cambridge: J-Pal and Massachusetts Institute of Technology.

level of education of parents, lack of pre-school services in rural areas and limited support from the community at large;

- **revive school libraries** and provide more resources for early grade students. Make the library a nice and comfortable place to enjoy reading;
- **monitor reading progress** in the classroom a few times per year for early detection of 'at risk' children having reading difficulties and providing targeted support and **remedial instruction** for struggling readers;
- organize teacher **training around modeling and practice** as teachers learn best by doing and interacting with other professionals (brief trainings with follow-up and refresher meetings);
- provide **regular professional development** to teachers and members of student support services through training and other activities as they are still in demand for instructional practice and support.

Some of the recommendations teachers should have in mind regarding reading and mathematics are the following:

- Students should be allowed to read at their own individual pace, even if it means that those slower readers are behind their quicker classmates. Reading fast, just for the sake of it, prevents the students to process information and understand what they read. Slowing down, reading sentence by sentence, talking about what was the content are strategies for practicing reading and eventually becoming a fluent reader.
- Reading in the classroom should not be forced only for the students to get good results at the assessments and tests. The teachers should build students' self-confidence as readers by honestly responding to their reading. An open discussion about the content of the story in which every comment will be deemed as valuable helps students to understand that reading is not a competition, or a test, but a lifelong skill that we use to gain information, acquire new knowledge and find a new perspective. Give students credit based on the thought and effort devoted to the answer, instead of whether the answer is "correct."
- The reading tests can also have different formats. Instead of asking them to select the correct answer on a multiple-choice or matching quiz, teachers should try with open-ended short essay questions or reading journals. Ask them to think of three good adjectives to describe a specific character and give examples of things those characters said or did to support the students' choice of adjectives. Ask them to rate the story's conclusion and explain why they give it a thumbs-up or thumbs-down.
- Students believe they have to finish every reading selection, no matter how long or difficult, so forcing students who don't read well to finish material that is far above their ability level or that has no relevance to them can ruin reading for them. Let the students choose what they want to read from a selection of educational books.
- Students fear their opinions will be wrong, so the teachers should accept every opinion, reward their honest effort and encourage them to develop their ideas logically and completely. With maturity and practice, the reading and writing skills will improve and students will be better able to appreciate literature that demands a more sophisticated approach.
- Teachers should find ways to group students in a way that does not depend on their reading ability, so to avoid labeling of students as slow readers, to avoid the situation where students correlate their intelligence to their reading group. Finding ways for slow readers to shine in other areas can be an effective way to help students understand that there are multiple forms of intelligence and that reading is one of many skills, but not necessarily an indicator of intelligence or the ability to learn.

- In multigrade classrooms—which combine classes of students from at least two grade levels— when teachers deliver curricula for one grade level, they should always encourage students from the other grade(s) to read and complete assignments independently.
- Manipulatives can be powerful tools to support sense making, mathematical thinking and reasoning when they are used as tools to support these processes rather than as adjuncts to blindly following a taught procedure to arrive at an answer, so teachers should provide open access to all the resources schools have and allow the children free reign in choosing what to use to model any problem they may be tackling. The range of resources should be as wide as possible as different manipulatives have different strengths for different problems and procedures. They should allow specific lessons for children to examine a particular manipulative and explore its power and potential. This could focus on what the children notice about the resource and how it relates to numbers and the number system.
- Introduce more opportunities for children to demonstrate to the teachers and one another mathematical truths using a range of artefacts. Research, independence and creativity in doing mathematical tasks should become of the classroom learning culture

At home:

- learning to read takes practice, more practice than children get during the school day to read comfortably and with expression. Parents should be encouraged to be engaged in **early literacy activities** with their children, such as: reading books, telling stories, singing songs, playing with alphabet toys, talking about things done, talking about things read, playing word games, writing letters or words, and reading aloud signs and labels, making picture books;
- children should have **access to different reading materials**. If there are no available resources at home, parents should visit the closest local library, or plan a trip to library in a larger town;
- parents should also be readers and writers, as **children learn habits** from the people around them.
- parents should be kept informed about their child's **progress** in reading and ask the teacher about ways they can help.

Schools can also help families with some simple strategies:

- invite families to the school to observe how reading and writing skills are taught in the classroom;
- host family literacy nights at school where students, families and community members work on fun literacy activities together;
- provide families with information about how their child is performing in reading and writing between report cards;
- use family and community members as reading partner volunteers and guest readers. High school students, college students and senior citizens are often eager to serve as volunteers in these kinds of programs;
- provide families and students with summer reading lists, apart from the mandatory list, to help them continuing to build reading skills over the summer;
- encourage students and families to check out books from the school library to read at home;
- create reading kits for students to take home. They can contain reading logs that can be filled out with their families and tips for family members about how to help their children with reading. The reading kits should contain three levels of books for

students and families – “read by myself” books, “read with me” books, and “read to me” books.

On a policy level:

- open dialogue with education institutions for **reviewing national programs** and policy and their implementation related to early grade language and mathematics;
- **align** language and mathematics **curriculum**;
- establish **national reading and mathematics performance measures** in Macedonian, Albanian and Turkish language for the early grade students and explore to what extent second and third grade students reach these standards;
- launch a national literacy campaign to raise awareness and increase community and family engagement to support early grade reading and mathematics. Any reading intervention should particularly target the children from rural areas and satellite schools;
- involve publishing companies through public-private partnerships to provide books and literacy resources to schools, libraries and even most disadvantages families, particularly in languages that children understand.