All Children Learning

Early Grade Learning Brief: JORDAN

I Findings

To gain insight into student performance on the most foundational and predictive skills in reading and mathematics, the Jordan Ministry of Education, in partnership with the United States Agency for International Development (USAID), conducted the National Early Grade Literacy and Numeracy Survey in Jordan during the spring of 2012. The National Survey included Early Grade Reading Assessment (EGRA), Early Grade Mathematics Assessment (EGMA), and Snapshot of School Management Effectiveness (SSME) instruments applied in 156 primary schools across the country. The principal findings of the National Survey are presented below as a basis for reflection and discussion.

On Early Grade Reading in Modern Standard Arabic (MSA)

EGRA subtask	% students with zero score		Average score obtained	
	Grade 2	Grade 3	Grade 2	Grade 3
Foundational skills for reading development				
Letter-sound knowledge	21%	28%	26.5 letter sounds per minute	26.3 letter sounds per minute
Decoding of new (invented) words	49%	45%	4.4 "new" words per minute	7.0 "new" words per minute
Listening comprehension of MSA	15%	8%	37% correct (2.2 / 6 questions)	48% correct (2.9 / 6 questions
Measures of ability to read connected text and to comprehend what is read				
Oral reading fluency	21%	20%	15.2 words per minute	23.7 words per minute
Reading comprehension	27%	22%)	33% correct (2.0 / 6 questions	48% correct (2.9 / 6 questions)

With regard to Jordanian children's foundational reading skills,

- ***Overall, students' knowledge of letter-sound correspondence was low.*** 24% of Jordanian students scored zero on this EGRA subtask. On average, students identified 26.4 letter sounds per

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minute, indicating a low level of skill mastery. Grade 3 students performed no better on average than Grade 2 students on this task.

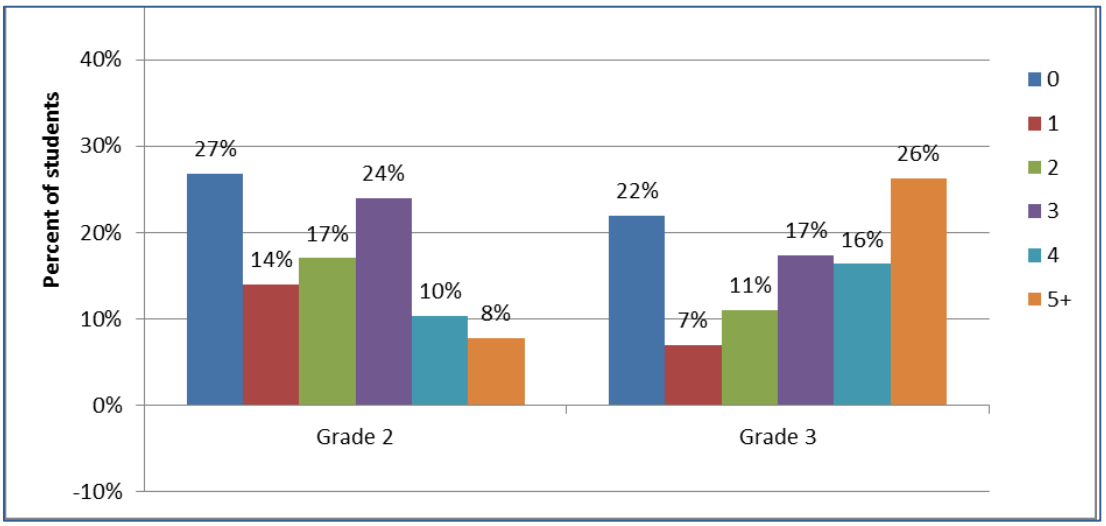
- ***Students' ability to decode new words was also low.*** 47% of Jordanian students scored zero on this EGRA subtask. On average, students correctly decoded only 5.7 words in one minute, indicating a very low level of automaticity. Ability on this task was higher among Grade 3 students than Grade 2 students.
- ***Students' comprehension of spoken MSA was modest.*** On average, students scored 42% correct on 6 listening comprehension questions about a short story. 12% of students were unable to show any comprehension. Ability on this task was higher among Grade 3 students than Grade 2 students.

On higher-order skills:

- 20% of students were unable to read a single word of a grade-appropriate MSA story text.
- 25% were unable to respond correctly to a single comprehension question about the story.

On the other hand, 17% of Jordanian children (8% of Grade 2 students and 26% of Grade 3 students) were able to read the full text and respond correctly to 80% or more comprehension questions.

Distribution of students according to reading comprehension scores obtained, by Grade



Foundational and higher-order reading skills are confirmed to be highly related. EGRA scores for the two extremes of this distribution—"poor readers" with 0% reading comprehension, and "good readers" with over 80% comprehension—showed a strong relationship among skills: Poor readers had very low scores on the other tasks as well, while good readers had much higher scores.

EGRA subtask	Poor readers (Reading comprehension = 0)	Good readers (Reading comprehension score = 80%+)
Letter-sound knowledge	14.4 letters per minute	33.2 letters per minute
Decoding of new (invented) words	0.3 words per minute	12.7 words per minute
Listening comprehension	28% correct (1.7 / 6 questions)	65% correct (3.9 / 6 questions)
Oral reading fluency	0.0 words per minute	45.1 words per minute

Scores of "good readers" offer useful benchmarks. EGRA scores of good readers suggest that, on average, students must increase their letter-sound knowledge and listening comprehension and more than double their invented word reading and oral reading fluency scores.

Girls tend to outperform boys. Average scores for girls, while not good, were consistently higher than for boys on three EGRA tasks (invented word decoding, oral reading fluency, and reading comprehension) in both grade levels. While an advantage for girls has often been found for language-related skills at this age-grade level, the instructional methods used in girls-only schools (which also showed consistently higher scores) are worth examining more closely.

EGRA subtask	Grade 2 boys	Grade 2 girls	Grade 3 boys	Grade 3 girls
Letter-sound knowledge	26.0 letters per minute	27.0 letters per minute	25.8 letters per minute	26.7 letters per minute
Invented word decoding	4.0 words per minute	4.8 words per minute	6.0 words per minute	7.8 words per minute
Oral reading fluency	13.5 words per minute	16.8 words per minute	19.0 words per minute	27.7 words per minute
Reading comprehension	28% correct (1.7 / 6 questions)	38% correct (2.3 / 6 questions)	42% correct (2.5 / 6 questions)	53% correct (3.2 / 6 questions)
Listening comprehension	37% correct(2.2 / 6 questions)	35% correct (2.1 / 6 questions)	45% correct (2.7 / 6 questions)	50% correct (3.0 / 6 questions)

Reading performance across regions and urban/rural settings showed only small differences at most. Students' reading performance was also examined across the three broad regions of Jordan (North, Central, and South) and by urban/rural setting, but these contrasts showed no consistently significant differences.

On Early Grade Mathematics

EGMA assesses a progression of foundational skills predictive of future success in mathematics. The subtasks can be divided into two groups:

- Subtasks that require **procedural knowledge**: number identification, quantity discrimination, addition of one- to two-digit numbers that does not require carry-over, and subtraction of one- and two-digit numbers that does not require borrowing.

- Subtasks that require more **conceptual knowledge**: discerning number patterns by filling in missing numbers, addition requiring carry-over, subtraction requiring borrowing, and word problems.

Jordan's National Survey found that although Jordanian students in general performed well on subtasks that assessed procedural knowledge, they were less able to demonstrate mathematical knowledge at a more conceptual level.

EGMA subtask	% correct / attempted		Correct responses per minute	
	Grade 2	Grade 3	Grade 2	Grade 3
Subtasks requiring procedural knowledge				
Number identification	89%	93%	32.1	37.8

EGMA subtask	% correct / attempted		Correct responses per minute	
	Grade 2	Grade 3	Grade 2	Grade 3
Discrimination of quantities	71%	77%	8.7	10.6
Addition level 1	84%	82%	13.6	14.6
Subtraction level 1	79%	76%	11.4	12.1
Subtasks requiring conceptual knowledge (application of procedural knowledge to new kinds of problems)				
Discerning number patterns (missing numbers)	57%	65%	4.8	6.0
Addition level 2	53%	55%	2,4	2.9
Subtraction level 2	32%	35%	1.3	1.8
Word problems	39%	52%	- - -	- - -

- ***Adequate to strong procedural knowledge.*** Grade 2 and Grade 3 students showed a solid level of performance on the procedural knowledge items in both accuracy (correct answers relative to the number of items attempted) and fluency or automaticity of responding (number of correct scores per minute).
- ***Weak conceptual knowledge.*** Performance accuracy, fluency, and automaticity at both grade levels dropped considerably, however, when conceptual knowledge was also required.
- ***Performance at Grade 3 was only modestly better than at Grade 2.*** Overall, performance of Grade 3 students indicated only modest progression relative to Grade 2 students, in both procedural and conceptual knowledge.
- ***No strong differences by gender, region, or urban/rural settings were found.*** Students' mathematics performance was also examined by region (North, Central, and South Jordan), urban/rural setting, and by gender, but no strong patterns of significant differences were found.

Jordan's EGMA results suggest that memorization plays a large role in the way Jordanian students learn mathematics, as procedural knowledge tends to be knowledge that can be memorized. But if students do not understand what they are doing and are unable to apply their knowledge to solve new kinds of problems, their future mathematical development is at risk.

Skills in mathematics and higher-order reading go together. Regression analyses on oral reading fluency and reading comprehension revealed strong relationships (26% to 30% of variance explained) with all measures of mathematics skill. Other measures of reading displayed smaller but still positive relationships with mathematics measures.

On School Management Practices

Some key findings from the national SSME include the following.

Basic school infrastructure and use

- Jordanian schools are well-equipped and well-maintained (functioning electricity, clean drinking water, and sanitation facilities; buildings and grounds clean and neat).

- Enrollment in schools observed was 342 students on average, and ranged from 23 to 1,310 students.
- Class size average was 23 students, and ranged from 3 to 49 students in observed classrooms.
- Average ratio of boys to girls was 1.04 at assessed mixed-gender schools.

Availability and use of reading material

- SSME findings coupled with EGRA results indicated that students with access to books were stronger readers than those without, and students who reported reading at home were stronger readers than those who did not.
- And yet, in 32% of classrooms, there was nothing for students to read other than textbooks.
- In addition, among students interviewed, 38% reported that they never read at home.
- Half (50%) of schools visited had a school library.

Teachers' preparation for early grade instruction is not sufficiently focused

- Fewer than half of teachers interviewed reported receiving specific pre- or in-service training in how to teach reading and mathematics in the early grades.
- Classroom observations indicated that teachers' approaches to reading instruction were not sufficiently guided by a well-structured and informed methodology.
- Observation of math classes suggested that teachers are also not well trained in the effective development of early number sense.

Curriculum and instructional content relative to students' skills

- The observed classroom lessons did not reflect students' actual skill levels as measured by EGRA and EGMA. Most teachers focused on completing the curriculum rather than addressing students' specific learning needs.
- While the majority of teachers reported using tests to measure student learning, only 22% said they used student's test results to modify their teaching according to students' needs. Assessment of students' learning is not having an impact on teaching.

Student characteristics

- 83.4% of students sampled reported having attended preschool or kindergarten prior to primary school, regardless of socioeconomic status.
- Children who attended preschool or kindergarten showed significantly stronger reading skills across all EGRA subtasks, but no advantage on mathematics skills assessed through EGMA.

Characteristics of strong-performing classrooms

To identify the most salient features of strong-performing classrooms, Grade 2 and Grade 3 classes were separately ranked according to their average performance on the reading subtasks; classes that performed at or above the 75th percentile were classified as "strong-performing." Top-income quartile classes were excluded, because greater school resources and wealthier families tend to mask some of the in-school features associated with stronger performance. Researchers also controlled for school location (urban/rural and region), school gender (all girls, all boys, and mixed), and class size. The results revealed a number of characteristics of classrooms, schools, and teachers that are associated with the stronger-performing classes.

Teachers in strong-performing classrooms:

- Were more likely to have received specific pre-service training in how to teach reading and math;
- Were more likely to use homework and worksheets as one of their student assessment methods;
- Were more likely to use constructive rather than punitive responses when students made errors;

- Were more likely to be satisfied with parental involvement; and
- Were more likely to use some non-textbook reading books in their classrooms.

Stronger-performing classrooms also:

- Tended to have been supported by the Ministry of Education in that they received more frequent Education supervisor visits (every two to three months during the year);
- Had lower than average student absenteeism rates;
- Had school principals who reported receiving Ministry visits in response to school requests; and
- Were more likely to have school principals who orally evaluated students themselves, which likely indicated more school principal involvement in classroom activities.

II Key Issues for Discussion

The results of National Early Grade Literacy and Numeracy Survey raise a number of issues for consideration in efforts to improve early grade learning for Jordanian students. Among the most important of these are the following.

Shift instructional focus toward learning for understanding

The findings indicate that early grade teaching in Jordan tends to focus on *what* children learn, with an emphasis on memorization and acquisition of information, rather than on *how* children learn, with an emphasis on understanding, application, and reasoning.

- On average, Jordanian students in grades 2 and 3 had not acquired adequate foundational reading skills to support fluent reading with comprehension and were unable to apply basic known facts about mathematics to solve new mathematical problems.

- At the same time, SSME results indicate that teachers reported a high completion rate with respect to the curriculum—teachers are "finishing" the curriculum, but with what result in terms of students' effective learning?

These issues point to a need for dialogue about what it means to teach and to learn—dialogue that shifts attention toward helping children learn for understanding.

Review and adjust curriculum content and delivery so that it responds to students' skill level

As noted above, the National Survey found that there is a high curriculum completion rate—in other words, teachers are following and "finishing" the curriculum—and yet, students are still performing well below the expectations of the curriculum. In other words, current early grade curricula for reading and mathematics are both inadequate and too ambitious.

- In the current curriculum, the focus on foundational reading skills such as letter sounds and single word production stops after Grade 1. But students in Grade 2 struggled with tasks involving these foundational skills.

- Similarly, the Grade 2 mathematics curriculum requires students to add and subtract three- and four-digit numbers, but the National Survey has shown that they struggled to add and subtract two-digit numbers.

- The review of current teaching and learning materials also reflects a focus on procedural knowledge and memorization rather than understanding, application, and reasoning.

Link teaching practice more closely to the results of student assessment

While teachers were using a wide variety of methods for student assessment, the results of assessment did not appear to inform teaching practice as much as they should or could.

- Teachers' assessment practices appeared to focus on collecting grades for students rather than gathering evidence to inform their teaching approach.
- And yet, assessments of students' skills strengths and weaknesses can help to identify foundational skills that need reinforcement before more advanced learning can occur.

Update training to equip teachers and principals with modern approaches to early grade reading and mathematics instruction

There is a need to improve coverage and to update content and approach of teacher training programs.

- In terms of coverage, the National Survey found that students of teachers who have had specific training on the teaching of early grade reading and mathematics perform better. And yet, less than half of teachers teaching in the early grades had received such specific training.
- In terms of content and approach, early grade teachers must acquire and practice new instructional and assessment methods and effective classroom routines that support their students' acquisition of essential foundational skills and their learning for understanding.
- What school principals and district pedagogical advisors do also affects classroom performance; they also need to understand and embrace the new approaches teachers will be using.

Possible actions to address these issues include the following:

- Explore ways to expose curriculum developers and teacher training communities to alternative pedagogical models and to support them in making the transition.
- Explore ways to help teachers change how they understand what it means to teach, to apply the curriculum, and to assess student learning.
- Examine the role of workshops versus on-site coaching during in-service teacher training.
- Explore ways to hold the various actors accountable for their roles in the transition process.
- Establish a roadmap that can prioritize the early grades in light of the foundational and predictive nature of the learning that takes place there.
- Take a long-term approach. Countries that have successfully addressed similar challenges have developed 10- to 15-year plans.

REFERENCE

RTI International (2013). *Student performance in reading and mathematics, pedagogic practice, and school management in Jordan* (EdData II Task Order No. 16). USAID / Jordan: Amman.