

Promoting Literacy Through Cognitive Science: Evidence from the UAE

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Introduction

Arabic-speaking students face a unique linguistic challenge in early-grade literacy: the significant gap between their spoken home dialects and Modern Standard Arabic (MSA), the formal language of instruction. This phenomenon, known as Arabic diglossia, can lead students to perceive MSA as a foreign language, undermining their motivation and engagement in reading.[1] The Iqra curriculum was developed to address this issue by applying insights from cognitive science to language acquisition.

Iqra was designed by Dr. Helen Abadzi in collaboration with the Al Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research (AQF), and aligns with the United Arab Emirates (UAE) Ministry of Education's ongoing efforts to strengthen Arabic reading fluency for early-grade students. Iqra relies on principles from cognitive science research to help students learn MSA. The program emphasizes repetition of language patterns to promote fluent reading. A pilot study in the UAE showed promising results, with students demonstrating improved literacy and reduced reading errors.[2]

To rigorously evaluate the program's impact and inform potential scale-up, we conducted a randomized controlled trial (RCT) in Ras Al Khaimah (RAK) during the 2024–2025 academic year. The evaluation was conducted in partnership with AQF and supported by J-PAL MENA at the American University in Cairo. This policy brief summarizes the program, its setting, and key findings from the evaluation.

Main Findings

1. **The Iqra program made a large and significant difference to teaching practices in the classroom**, resulting in the use of distinct pedagogical techniques and materials in Iqra classrooms compared to the control classrooms. Program implementation went largely as planned.
2. **The program significantly improved Arabic literacy across key literacy domains, including letter identification, word reading, and reading fluency.** The program's impact compares well with other literacy and education interventions evaluated rigorously in a diverse set of global contexts [3].
3. **No significant effects were observed on secondary mechanisms - neither positive nor negative.** In particular, Iqra neither crowds out nor complements performance in math, and it does not inherently build higher attention capacity. Despite some parental engagement components, Iqra also did not meaningfully improve children's home literacy environment.

Program

Iqra is a structured curriculum designed to improve reading skills among early-grade students. It addresses the cognitive barriers posed by Arabic's complex script and grammar, which contribute to slower reading rates and lower performance in international assessments.

Key features of the program include:

- **Systematic letter-by-letter instruction**, beginning with simple, non-connecting letters and progressing to more complex ones.
- **Integration of short vowels (*harakat*) and letter combinations** to reinforce learning.
- **Use of large fonts and extra spacing between letters** to enhance visual clarity and pattern recognition.
- **Omission of pictures**: only a few pictures appear in the Iqra materials to avoid distractions from the text.
- **Interactive pedagogy**, such as paired, echo, and choral reading.
- **40 lessons, each lasting approximately 45 minutes**, designed to be completed over one academic year.

The curriculum is delivered either during regular Arabic instruction or as an extracurricular activity, depending on the school. Teachers implementing Iqra received training and materials from AQF to ensure fidelity to the program design.

Research design

The evaluation took place in 26 schools (7 public and 19 private) across RAK. The sample included both Emirati and international schools. Each school selected either Grade 1 or KG2 for participation. In total, 83 classrooms were included, with 41 randomly assigned to the Iqra program and 42 to the control group. Twenty-one schools implemented Iqra exclusively during regular Arabic instruction time, within the existing staff and resource budget. Only five schools implemented Iqra at least partially outside of Arabic lessons, typically still within regular curriculum hours, such as by replacing physical education.

Control classrooms continued with the standard Ministry of Education Arabic curriculum. Treatment classrooms received two IQRA sessions on average weekly, with the remaining Arabic classes following the MoE curriculum. Random assignment of control and treatment classrooms mitigates the role of confounding factors when estimating the program's effect on outcomes. Randomisation of classrooms was stratified at the school level, implying that school-specific effects can be controlled for.

We assessed student literacy in Arabic, our primary outcome, twice: at baseline in September-October 2024, prior to random assignment; and at endline in May-June 2025. We randomly sampled up to 15 students from class rosters at baseline. At endline, we reassessed students from the baseline and randomly sampled additional students to reach a target of 15 students per classroom. All students included in the sample received parental consent to participate.

We measure Arabic literacy by performance on the Early Grade Reading Assessment (EGRA), an oral assessment validated and used across many languages and contexts. We adapted an Arabic language version of EGRA for the evaluation, choosing subtasks to cover skills appropriate for the age of sampled students and the intervention: initial sound identification, letter sound identification, familiar word and nonword decoding, oral reading fluency, and reading comprehension

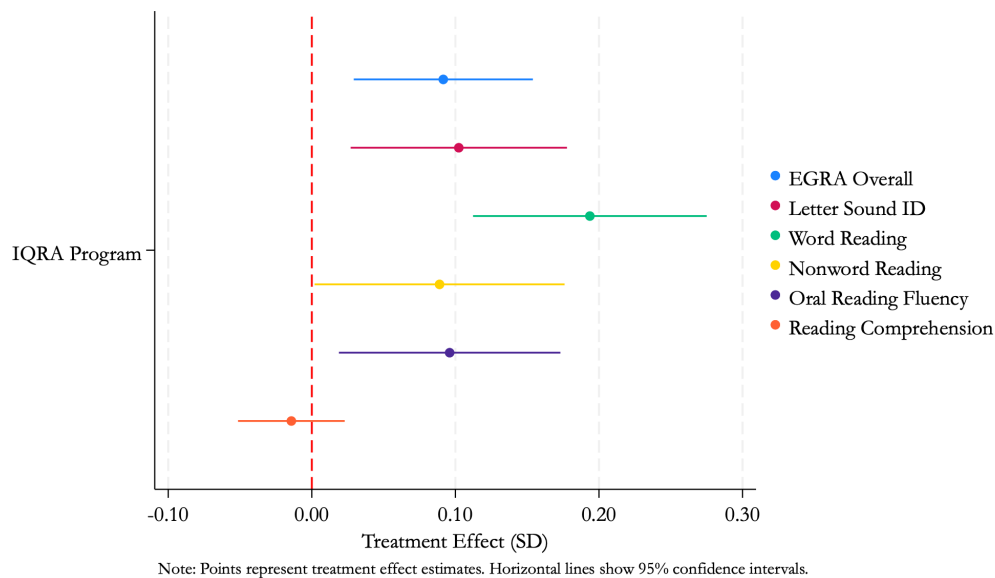
Findings

Arabic literacy

We find the program increased overall Arabic literacy by a statistically significant 0.09 standard deviations compared to the control group. This effect implies that the median student in a control classroom would move from the 50th to the 54th percentile of Arabic literacy if exposed to the program.

The program increased students' ability to read words, non-words (nonsense words that test the ability to decode sounds), identify letters, and read more fluently. The program was particularly effective at improving word reading, with an effect of 0.19 standard deviations (equivalent to moving the median control student from the 50th to the 58th percentile). The only task on which Iqra students did not improve significantly was reading comprehension, which was not explicitly taught by the program and tends to develop at later stages of literacy, once more fundamental competencies have been acquired.

Figure 1: Iqra improved Arabic literacy



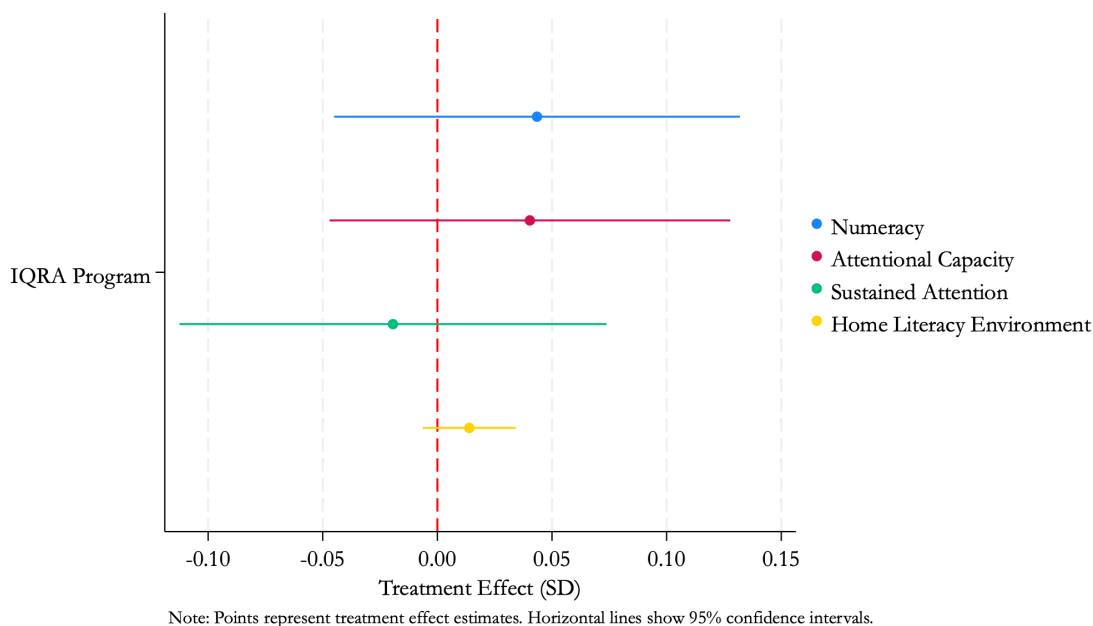
Estimates suggest that Iqra leads to reading improvements equivalent to an additional 25% of a school year, relative to the progress made by students in the control group under the business-as-usual approach. The program's impact also compares well with other literacy and education interventions evaluated rigorously in a diverse set of global contexts.[3]

Other student outcomes

We also tested whether the program affected other student outcomes. For instance, the program could improve mathematics scores if improved literacy facilitates numeracy, or it might decrease mathematics scores if it distracted from mathematics learning. Furthermore, the program's focus on repetitive practice may increase students' capacity to pay attention or sustain their attention for longer periods. Improved attentional capacity may have effects on general academic performance. Finally, the program might improve the home literacy environment by encouraging parents to read more with their children at home.

Figure 2 shows estimated treatment effects on numeracy, attention, and home literacy environment. We find no statistically significant effects of the program on any of these outcomes. This suggests that, while Iqra is effective in directly improving literacy, it does not have positive or negative spillovers on other outcomes.

Figure 2: Iqra did not affect secondary mechanisms



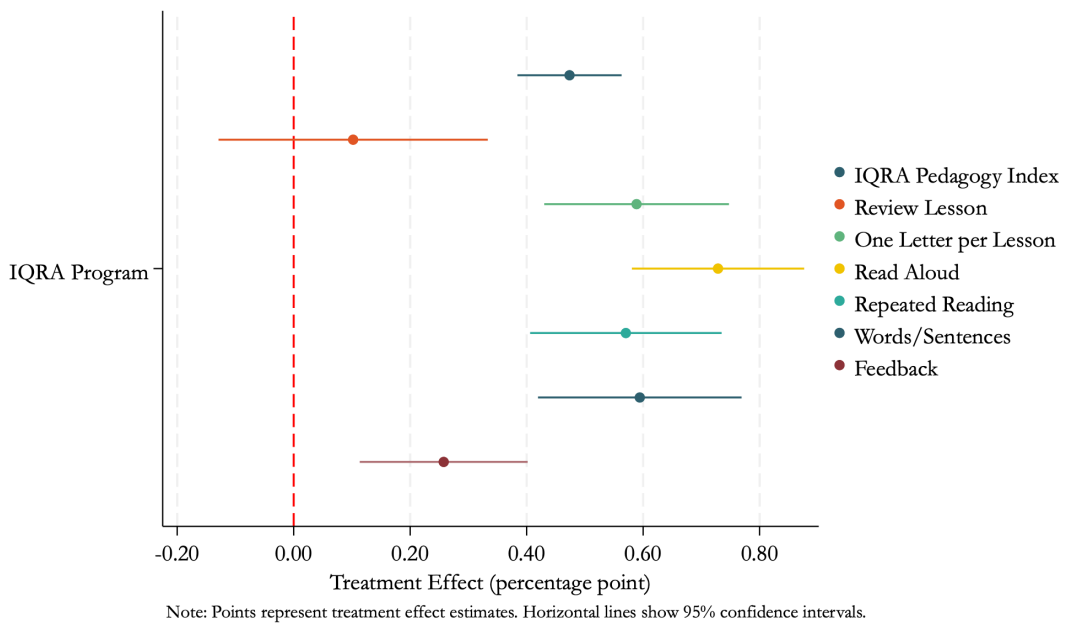
Effects on pedagogy

Using independent professional enumerators, we observed classrooms to understand how teachers' pedagogy changed in Iqra classes compared to standard MoE curriculum classes. To measure pedagogy, we constructed an index of teacher behaviors aligned with Iqra practices, including focusing on one new letter or vowel per class, reading aloud with students,

encouraging repeated reading of targeted materials, presenting words and sentences using the target letter, and providing feedback and support. We find the program increased the observed frequency of these practices by 47 percentage points, or more than 2.5 times the rate in control classrooms. We also find statistically significant increases in nearly all the individual pedagogical practices measured.

Moreover, Iqra classrooms used program-specific materials at 8 times the rate of control classrooms. Finally, we find that Iqra classrooms did not use pedagogical techniques or materials from the MoE curriculum (such as MoE textbooks, multimedia, or writing instruction) as frequently as control classrooms.

Figure 3: Iqra had real effects on teacher practices



We draw two conclusions from these results. First, Iqra was implemented largely as intended by the program. Second, Iqra is effective at shifting real-life teaching practices, resulting in the use of distinct pedagogical techniques and materials.

Policy implications and recommendations

The Iqra program demonstrated clear improvements across multiple domains of literacy, including letter identification, word reading, and reading fluency. Effects are quantitatively largest on word reading. However, there remains room for further improvement in other reading skills, particularly in “downstream outcomes” such as reading comprehension, which typically develops at more advanced literacy stages.

The positive results of the Iqra pilot echo the [World Bank's](#) emphasis on bridging the gap between colloquial Arabic dialects and Modern Standard Arabic (MSA). Iqra's approach to teaching MSA may offer a replicable model for addressing this fundamental challenge across Arabic-speaking countries, subject to replication and testing at scale within the UAE first. It is recommended that policymakers invest in *interventions that explicitly address diglossia*, rather than assuming students will naturally acquire MSA literacy skills.

The results show a significant improvement in foundational skills (letter identification, word reading), but not in reading comprehension, which was not explicitly part of the program. This is an indicator that governments must *first ensure students have strong foundational literacy skills* before focusing on higher-order comprehension skills.

The program is likely to be cost-effective, as it utilizes existing staff and resources, requiring only a few days of additional teacher training. Out of the 26 schools in our study, at least 21 implemented the programme fully within regular curriculum hours.

Implementation quality was high, as reflected in strong adherence to the study protocol and fidelity to Iqra's teaching methods. The study's demanding design, which involved randomizing classrooms within the same school to receive Iqra or not, makes this high-quality implementation particularly impressive. A school-wide adoption of Iqra could further enhance implementation by simplifying coordination across early-grade Arabic classrooms.

Sustaining high implementation quality at scale may pose challenges. While direct program costs are likely to be manageable (a few days of teacher training), scaling will require intensive monitoring support to ensure consistent implementation quality until Iqra has been established as the standard approach.

In this evaluation, AQF played a crucial role in supporting teachers and ensuring the fidelity of implementation, which required the time and effort of skilled facilitators. This need for monitoring, which is common for programs introducing novel pedagogical approaches, will be essential to maintain consistent quality as Iqra expands across RAK and the wider UAE.

[1] Eviatar, Zohar, and Raphiq Ibrahim. "Why is it hard to read Arabic?." In *Handbook of Arabic literacy: Insights and perspectives*, pp. 77-96. Dordrecht: Springer Netherlands, 2014.

[2] Wilson, Elisabeth, Soohyun Jeon, Holly Cook, and Helen Abadzi. "Perceptual Enhancement for Arabic Reading: An Intervention to Support Fluency and Automaticity in Grade One." *Gulf Education and Social Policy Review (GESPR)* (2020): 1-21.

[3] Evans, David K., and Fei Yuan. "How big are effect sizes in international education studies?." *Educational evaluation and policy analysis* 44, no. 3 (2022): 532-540; Kim, Young-Suk G., Hansol Lee, and Stephanie S. Zuilkowski. "Impact of literacy interventions on reading skills in low- and middle-income countries: A meta-analysis." *Child development* 91, no. 2 (2020): 638-660; Sandefur, Justin, Thomaz Alvares de Azevedo, Xiaomin Ju, and Thi Le. *Phonics and Foreign Aid: Can America Teach the World to Read?*. No. 668. Center for Global Development, 2023.