

Tuned in to Student Success

Assessing the Impact of Interactive Radio Instruction for the Hardest-to-Reach



This study looks at the use of radio to teach children who are not in school, who are affected by conflict, who are orphans, who live in countries where most social systems have broken down or never existed - the poorest, least supported and most remote learners to whom access to education has traditionally been denied.

Interactive Radio Instruction (IRI) delivers daily 30-minute radio broadcasts that promote active learning and are designed to improve educational quality and teaching practices in schools as well as to deliver a complete basic education to learners not in school. Evaluation data gathered between 1975 and 2000 demonstrated that IRI had improved learning outcomes in conventional classrooms. This paper uses student assessment data collected from recent EDC IRI projects to determine the impact of IRI on student achievement in more taxing circumstances than those earlier observed, as well as on learning in conventional school settings. In all, 15 projects provided 37 records (grade-year combinations e.g. grade 1 in 2007) containing student learning data which served as the basis of this review.

The data indicate that exposure to IRI is associated with higher levels of student achievement. Generally, students in IRI classrooms demonstrated learning advantages over their non-IRI peers, as was observed in all but 7 of the 37 cases analyzed. The impact of IRI on student achievement was examined across projects by grade and by subject, by several categories of marginalized populations (by gender and location, for learners in fragile states, and for Orphans and Vulnerable Children), and for programs developed for

pre-primary learners. The effects of IRI as a delivery mechanism for teacher professional development was also reviewed.

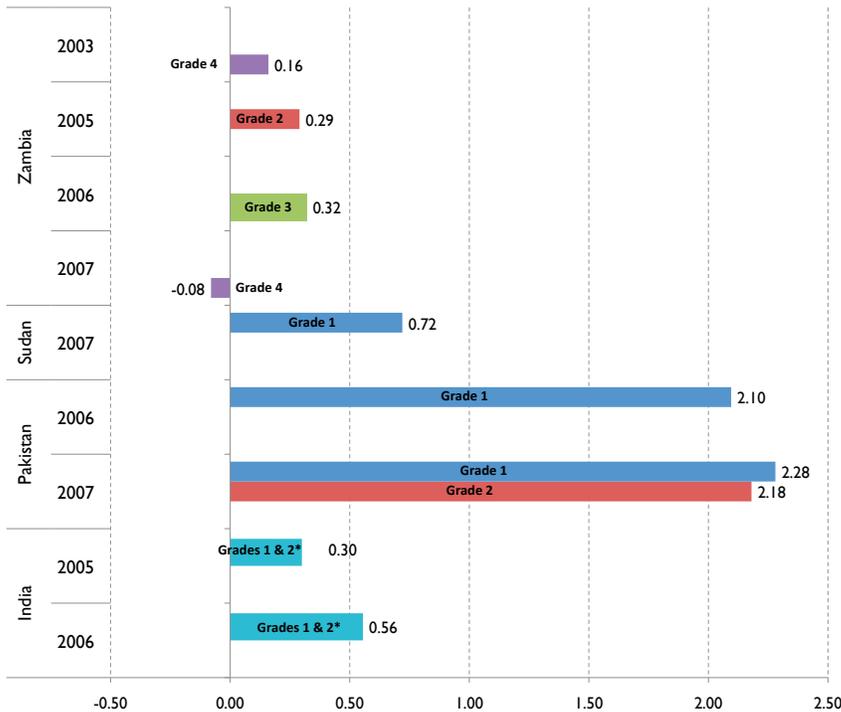
Average effect sizes analyzed ranged from -0.16 to +2.19 across a variety of subject areas, projects, and participant countries, suggesting that several factors affect the degree to which exposure to IRI can improve student achievement. What remains clear, however, is that IRI consistently produces learning gains among its participants of diverse ages and in diverse settings.



What is Interactive Radio Instruction?

Interactive Radio Instruction (IRI) is an instructional tool designed to deliver active learning by radio. Audio lessons are developed to guide the teacher or facilitator and students through activities, games, and exercises that teach carefully organized knowledge and skills. During short pauses built into the radio scripts, teachers and students participate in the radio program, reacting verbally and physically to questions and exercises posed by radio characters. In this way, IRI exposes learners to regular, curriculum-based content and models effective teaching and activities for teachers.

English Effect Size Comparison by Country, Grade, and Year



In English...

data collected from 2003-2007 show that IRI has almost always improved English language competency in the cases examined in Zambia, Sudan, Pakistan, and India (as shown here). Across all grade levels, students participating in IRI have been observed to outperform their control school counterparts. Notably, summary results by grade show that, in grade 1, had the average control student participated in IRI, she would have been ranked in the 96th percentile at the time of year-end testing rather than the 50th; the 46 percentile “boost” in rank at year-end is attributed to the effectiveness of IRI instruction. In grade 2, the average control student would have been ranked in the 89th percentile had he participated in IRI English programming.

In Mathematics...

data are analyzed from IRI projects implemented from 2003-2007 in four countries: Zambia, Sudan, Haiti, and India. A summary review of these results illustrates an effect size of 0.41 in grade 1. This tells us that had the average control student participated in an IRI math program she would have been ranked at the 66th percentile of her class rather than at the 50th, representing a 16 percentile “boost” in rank attributable to the effectiveness of IRI instruction. Subsequent grade levels through grade 4 also demonstrate positive effects of IRI math programming.

In Social Studies...

the introduction of subject content using IRI is a recent development. Analyses draw upon a limited data set including student assessment results from India and Zambia in 2006 and 2007. Student learning outcomes in both countries show slight advantages for IRI learners in grade 4 programming as well as in grade 4 and 5 combination programming. Grade 3 results from Zambia are stronger and suggest that had the average control learner participated in the IRI social studies series, she would have been ranked at the 58th percentile rather than at the 50th.

In Local Language Literacy...

analysis incorporates data from four countries: Zambia, Sudan, Somalia, and Haiti, spanning 2003-2007. Positive effect sizes observed in grades 1-4 evidence IRI's stimulation of favorable learning outcomes in primary literacy instruction. Of particular note is the effect size calculated for grade 1, wherein the control learner, had she participated in IRI programming, would have been ranked at the 68th percentile at the time of post-test administration rather than at the 50th.

IRI AND EARLY CHILDHOOD EDUCATION

In addition to delivering primary-level classroom content, IRI has also been applied at earlier stages of cognitive and social development as a tool to support early childhood development and education. Student assessment results reviewed under this study show IRI to be an effective pre-primary intervention in terms of early childhood development.

In El Salvador...

assessment results were drastically lower for IRI learners than for control learners at the time of pre-test evaluation. However, by post-test administration, the percentage of IRI learners categorized as “Needs Improvement” dropped by 23 points, while control school saw a reduction of 5 percentage points. After only a few months or program participation, the percentage of IRI learners evaluated as “Excellent” jumped from 34% to 82% while Control schools saw a rise in the percentage of students in this category from 67% to 80%.

In Honduras...

an EDC-led project, *Juego y Aprendo*, established 53 early childhood IRI centers with the objective of increasing access to pre-primary education. It was not expected that, following 12 months of intervention, the project’s alternative IRI centers--staffed with volunteer educators--would match student achievement levels attained by the control group comprised of existing, formal pre-schools. Despite this, post-test scores for IRI and control group learners were not seen to be significantly different. This was true for centers in both urban and rural regions.

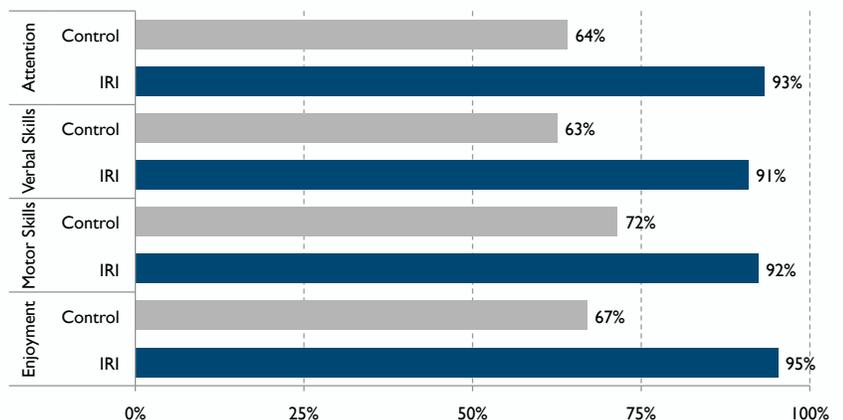
In Indonesia...

although assessment results favored control learners over IRI learners at the time of pre-test, the percentage of IRI kindergartners meeting “average” and “above average” criteria were seen to be equal to or greater than students from control kindergartens in every subcategory at post-test examination. Of note, this meant an increase in the percentage of DBE 2 students meeting or exceeding school readiness requirements in each Language and Cognitive Development categories by 21 points from pre- to post-test where control kindergartners increased by 13.

In Bolivia...

assessments measured learner levels of verbal communication, physical activity, positive affects and engagement, and skill levels in performing designated tasks. Caregivers in classrooms using IRI were consistently more positive in their reviews of children’s attention levels, skills, and general enjoyment of learning activities than caregivers in control classrooms. Complementing these observations, student assessment results show IRI learners had outperformed their control counterparts in each subcategory by an average margin of 27 percentage points. These achievements are considerable, particularly given that target beneficiaries represented large, often remote audiences, and that caregivers required training materials and program tools not reliant on high-level reading skills or face-to-face instruction.

Bolivia: Learner Assessment Results by Treatment Group



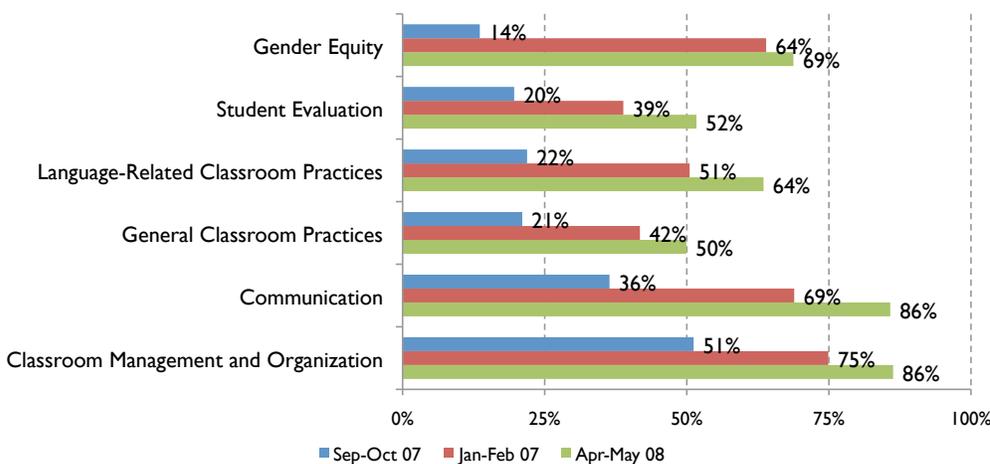
Though in most contexts Interactive Radio Instruction has followed a dual-audience approach involving direct instruction to students while modeling teaching strategies and classroom organization techniques for teachers, IRI has also been used specifically for

TEACHER PROFESSIONAL DEVELOPMENT.

In Madagascar...

radio teachers would model games, songs, and student-centered learning activities for their classroom counterparts, aiming to improve teaching in mathematics, French and Malagasy. Pauses in the radio programs allowed participating teachers time to try new activities with their students while listening to the program. The primary objective of both programs was to improve the quality of classroom instruction with an emphasis on active learning and student-centered methodologies.

% Teachers Observed Using Domain of IRI Practices More Than Minimally (Grade 1)



For both grades 1 and 2 teachers, steady improvements are observed from baseline testing to final evaluation. Grade 1 observation results (shown here) illustrate that teachers improved by a minimum of 31 percentage points in each of the six key areas evaluated, with a marked improvement by 51 percentage points in the area of gender equity (64% of observed teachers in 2008 used gender equitable practices more than minimally, up from 13% in 2007). Grade 2 teachers improved in all six areas by at least 29 percentage points, where again, the most dramatic gains appeared in the area of gender equity (69% of observed teachers in 2008 used gender equitable practices more than minimally, up from 14% in 2007).

In Mali...

teacher training was introduced via IRI as a delivery mechanism built to overcome long distances, reaching educators at the school and classroom level. Radio-based in-service training complemented school-based “communities of learning” and face-to-face trainings developed by the Ministry of Education. This IRI series offered two types of programming: one for listening groups of teachers gathered after school hours, and another for use during French and mathematics lessons.

Results from teacher observations indicate real improvements in instructional practice over the course of the project. Each evaluation shows steady gains in teachers’ familiarity with, and use of, all key techniques emphasized by the program. Increases in teachers’ facility with brainstorming are particularly notable, with the percentage of participant teachers familiar with, and the percentage using brainstorming during non-IRI lessons escalating 59 percentage points from 2005 to 2007. Also of note is the percentage of teachers familiar with cooperative learning (93% in 2007 up from 36% in 2005), and the percentage of teachers observed using group work during non-IRI lessons (75% in 2007 up from 18% in 2005).

MARGINALIZED STUDENT POPULATIONS

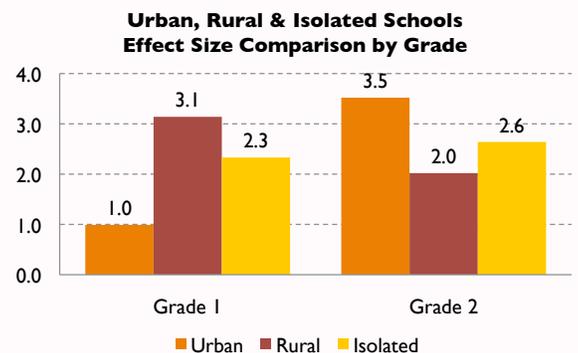
It goes without saying that even before marginalized children can step into a classroom, they must first contend with basic needs for survival. If they do attend, they are often subject to high truancy and attrition rates. Student learning data used to establish the impact that IRI can have on such populations must be understood in the sometimes dire educational contexts in which IRI is being used.

Girls and Boys

While IRI boys enjoyed a larger boost over non-IRI boys than IRI girls did over non-IRI girls, the difference between IRI boys' and IRI girls' performance, on average, appears small. English results by country show that mean scores for females mirror the general trend of mean scores for males--when boys did better, so too did girls. In local language literacy (which includes both reading and writing), the data show more variability in achievement compared to English. Looking closely at the gap between boys' and girls' math performance, we see that, in general, when boys perform better, it is likely that the girls will also perform well. However, when boys perform poorly, it is likely that girls will perform poorly and perhaps even more poorly.

Rural and Urban Students

Rural IRI students enjoy approximately the same boost in achievement over their non-IRI peers as urban IRI learners, and outcomes show that rural students continue to benefit from IRI programming despite an increased interest in recent years on IRI as a means to reach remote learners. The results for student achievement scores in isolated IRI classrooms (shown here) are also impressive, in an absolute sense (in both grades, isolated learners' post-test effect sizes are significant and large), as well as in a relative sense (in both grades, isolated learners show learning gains that are between their rural and urban peers).



Students in Fragile States

While the quantity of available data is limited to experiences in Sudan and Somalia, student assessment results reviewed for IRI learners in fragile states are nonetheless encouraging. Those students who participated in IRI classes had a distinct advantage over their non-IRI



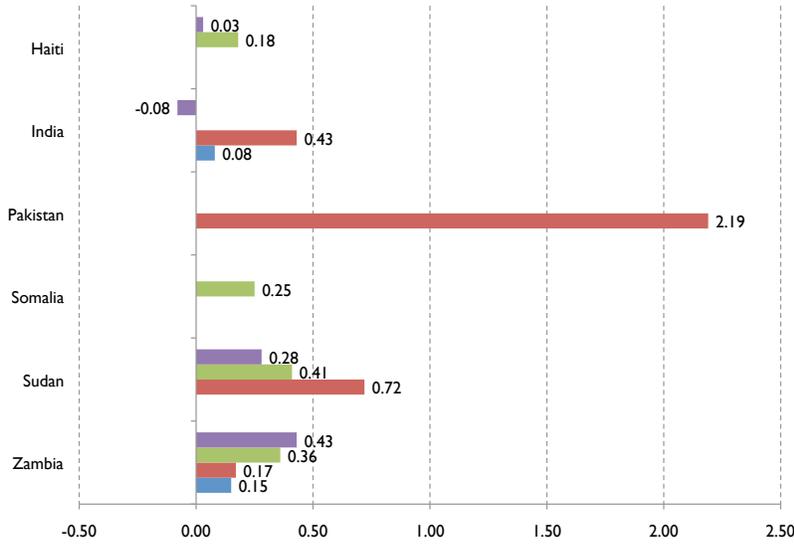
peers, and this advantage was consistent across subjects. The greatest advantage was observed in English, where the average IRI student was seen to achieve a mean score than 29 percentage points higher than that of her control school peers (effect size 0.8 in Sudan), followed by mathematics (effect size 0.6 in Sudan) and local language literacy (average effect size of 0.6 across both Somalia and Sudan).

Orphans and Vulnerable Children (OVCs)

Available student assessment data for OVCs is limited to a single project in Zambia. Results from community schools and IRI centers, which generally support larger OVC populations than formal schools, are used as a proxy for results for OVCs. Data from 2006 for grade 2 students show a small advantage for learners participating in IRI community schools and IRI centers in mathematics and lifeskills over their non-IRI peers, although the impact of IRI in local language literacy and English is not as encouraging. In mathematics, the advantage enjoyed by IRI students in community schools and IRI centers is small when compared to the advantage IRI students in formal schools enjoyed. Conversely, in lifeskills instruction, IRI students in community schools and IRI centers demonstrate a mean that is at the 54th percentile of non-IRI students in community schools (effect size of 0.1).

SUMMARY REVIEW

Average Effect Sizes by Country and Subject



	Zambia	Sudan	Somalia	Pakistan	India	Haiti
Mathematics	0.43	0.28			-0.08	0.03
Local Language	0.36	0.41	0.25			0.18
English	0.17	0.72		2.19	0.43	
Social Studies	0.15				0.08	

The researchers were continually reminded of the varying nature of EDC’s IRI model from country to country, which includes a significant local capacity-building effort. By design, IRI programming can vary both within and between contexts as it responds to the local needs and range of locally available resources. This characteristic of IRI development at EDC renders it all the more difficult to make sweeping conclusions in a composite report. Nonetheless, an attempt has been made to create an overall picture of IRI results across the several variables analyzed within this study, and effect sizes have been averaged across grade level and year to obtain a composite metric for each subject assessed.

Overall, positive summary effect sizes are observed in a large majority of the cases presented here. Effect sizes of 0.25 and

greater show that learners benefited from a minimum 10 percentage point “boost” in rank with participation in IRI. This was achieved in all countries shown, except in Haiti, and was true across mathematics, local language literacy, and English instruction. Though effect sizes may, in some places, appear to be modest, they do evidence tangible benefits in student learning with exposure to IRI. This is especially true given that most of these findings suggest that IRI learners do have an advantage over their non-IRI peers over the course of only one academic year.

From the present library of data, it is clear that in addition to exposure to IRI, country-specific circumstances, quality of project implementation, and the extent to which students actually do listen to programs, factor heavily into the impact that IRI can have on student learning. A review of learning outcomes in and of themselves brings to light some of the successful, and not-so-successful, IRI experiences EDC has most recently observed.



EDUCATION DEVELOPMENT CENTER, INC.
INTERNATIONAL DEVELOPMENT DIVISION

1000 Potomac St. NW, Suite 350 • Washington, DC
Telephone: 202.572.3700 • www.edc.org