

WORKING PAPER
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**Improving Teaching
Quality in Guinea with
Interactive Radio
Instruction**

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Guinea's *Sous le Fromager* project is an excellent example of radio as an effective delivery system for enhancing **teachers' basic content skills** and for helping teachers with little or no instructional skills acquire those skills.

The logo for infoDev, featuring the word "infoDev" in a white, lowercase, serif font. Above the letters "i", "n", "o", and "D" are several small white dots of varying sizes, arranged in a slightly curved pattern.

WORKING PAPER NO. 2, 2006

Improving Teaching Quality in Guinea with Interactive Radio Instruction

February 2006

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Improving Teaching Quality in Guinea with Interactive Radio Instruction



“Bonjour Madame,” “Bonjour enfants!”

“Bonjour Monsieur!” The 55 children at L’Ecole Ange Gardien, respond in unison, faces smiling and bodies upright in anticipation of what is to follow. For the next 30 minutes, these fourth year students will sing, dance, solve math problems, work alone or with a partner, and respond enthusiastically to mathematics and French-language questions as part of the popular interactive radio instruction (IRI) program, *Sous le Fromager*.

Students sign and dance to a song about mosquitoes, the aim of which is to help recognize hard and soft “s” sounds.

Located 2 hours from Conakry, Guinea, in the community of Manéah, Ange Gardien is one of thousands of Guinean primary schools in which *Sous le Fromager* (*Under the Kapok Tree*) provides math, science and French instruction that would unlikely be available due to Guinea’s severe teacher shortage. But students are not the only beneficiaries of IRI. *Sous le Fromager* also appears to be an effective professional development tool for teachers, delivering content knowledge and structuring lessons in such a directive manner that teachers can immediately implement more interactive instructional approaches.

The program, broadcast over the course of 22 weeks, reaches on average 22,000 year one through six teachers and 85 percentⁱ of the total primary school audience in Guinea.ⁱⁱ

Information about the number, length and focus of broadcasts for *Sous le Fromager* is included in Table One.

<i>Sous le Fromager</i>: Basic Information				
Primary Grades	Subject or Content Areas Addressed	Broadcasts per week	Length of Broadcast	Number of Programs in School Year
1-4	French, math	3	30 minutes	66
5-6	Math, science	2	45 minutes	44

Table 1: Basic Information on *Sous le Fromager*

FQEL Project: Radio and Audio-based TPD

Funded through the United States Agency for International Development (USAID) and administered by Education Development Center (EDC) and the Institut National de Recherche et Action Pédagogique (INRAP), *Sous le Fromager* served as a cornerstone in the Fundamental Quality in Education Level (FQEL) project (1998-2005), a suite of ICT-based interventions to help the Government of Guinea address its three main educational issues—increasing the number of teachers, increasing teacher quality, and improving instructional quality, particularly in rural areas of Guinea and for girls.

These interventions were:

- classroom-based IRI (*Sous le Fromager*)
- a radio program aimed at teachers, principals and prefectural staff (*Pas à Pas*)
- face-to-face professional development sessions integrating audio taped recordings of *Pas à Pas* segments (*Cercles de renforcement* and *bimonthly meetings*)

Each ICT-based intervention is discussed below:

(1) Classroom-based IRI

Sous le Fromager is an excellent example of radio as an effective delivery system for enhancing teachers' basic content skills and for helping teachers with little or no instructional skills acquire those skills.

What is Interactive Radio Instruction?

First developed by Stanford University for math instruction in Nicaragua in the 1970s, interactive radio instruction (IRI) has been used effectively in low resource areas with few teachers or few qualified teachers.

Interactive radio instruction (IRI) is an instructional approach that uses *one-way radio* to reach *two audiences* (students and the in-class teacher) and prompts *four way* communication:

- Radio teacher—in-class teacher
- Radio teacher—students
- In-class teacher—students
- Students—students

The radio “teacher” delivers content and orally directs teachers to apply more interactive instructional approaches within the classroom. Both the content and activities of the radio program are based on the national curriculum and use a series of structured learning episodes in which students are prompted to sing songs, do individual and group work, answer questions, and perform certain learning tasks. The approach is “interactive” because the radio “teacher” speaks to students and students respond to radio prompts.

The radio program is highly structured—the radio “teacher” leads the in-class teacher and students through a series of activities that direct the in-class teacher’s instructional development. The in-class teacher assumes a hybrid role—*co-teaching* with the radio teacher and *co-learning* (content, for example) along with students. Instructional strategies are embedded in the activity and are reinforced over the course of the academic year through the directives of the radio teacher.

In addition to actual programming, teachers receive instructional materials and detailed teacher guides to assist them in preparing for and carrying out activities. Teacher guides use text and drawings to help teachers know what to do before, during and after a radio broadcast.

Sous le Fromager employs three approaches:

- Developmental learning
- Multichannel learning
- Positive and equitable relations between teachers and students

and nine instructional strategiesⁱⁱⁱ:

- Games
- Group work
- Information processing
- Individual work
- Application of information
- Problem solving
- Self-assessment
- Project-based work
- Critical thinking

As class begins, the school leader, or more commonly, a student, delivers the radio or audiotape player (many schools have their own “libraries” of *Sous le Fromager* broadcasts), placing it on a table in the front of the room. As the introductory music plays, the changes in student posture and facial expressions become evident. Students are alert and engaged.

Sous le Fromager consists of two main characters—a man and a woman. The radio characters serve in effect as “master teachers.” They immediately engage the in-class teacher and students through greetings and a series of short statements followed by pauses in which the in-class teacher restates the activity or follows the radio character’s instructions. The radio teachers explain the activity, model a typical response to a question, and always direct authority for the activity to the in-class teacher. (“Madame or Monsieur, please ask a girl to add 12 plus 12.”). All actions originate with the radio characters, are carried out by the in-class teacher, and are aimed to engage students in the learning process.

Activities are fast paced (typical IRI broadcasts have 100 responses per 30-minute broadcast^{iv}) which helps to increase student engagement, teacher interest and time on task. During the course of one IRI broadcast, students were engaged in the following learning activities that clearly focus on addressing students’ multiple learning “styles” (aural, oral, musical, verbal, and written)^v:

- *Listening* to a song about mosquitoes as part of learning the difference between a hard and soft “s” sound
- *Singing and dancing* to the same song
- *Individual work/game*: Subtracting math problems on their slates. The pace and the tone of the radio characters gave the exercise a game-like quality
- *Responding* to a series of math problems
- *Writing* French vocabulary words onto their slates
- *Moving*: Clapping once when they heard a number less than 25 and kicking once for a number greater than 25; placing their hands *on* desks when they heard the French word for “on” (*sur*) and *under* desks for the French equivalent of “under” (*sous*).

Activities are punctuated with wait time (instrumental music plays) and songs. Teacher training strategies are explicit (“Madame or Monsieur, walk to the middle of the room....ask a female student to respond.”). The teacher does not need to consider how she will organize learning; the radio does it for her.

Sous le Fromager, in addition to providing teachers with cognitive skills (content and instruction, most noticeably), the program appears to be highly effective in modelling many positive affective dimensions of learning, at least as observed during actual classroom episodes of the program. These include:

- **Respect toward the teacher:** All *Sous le Fromager* programs invoke teacher participation and action in every step of the learning process. The in-class teacher is very much a co-instructor with the radio instructor.
- **Respect toward girls:** The radio instructor reminds in-class teachers to call on girls, with the result that there is a distinct pattern of boy-girl responses in IRI classes. Additionally, the male and female radio characters speak for equal amounts of time and address one another as equals. The content and tone of language do not place women in stereotypical gender roles. This is quite important in regions where girls suffer from extreme gender stereotyping and where boys' education is favored over that of girls.



A student does individual math work during an episode of *Sous le Fromager*.

- **Respect toward students:** The tone of radio broadcasts is one of respect. Students are commended for correct answers, for their hard work, and the in-class teacher is instructed to praise students for their effort. EDC staff has reported that, prior to *Sous le Fromager*, teachers frequently hit students when they gave incorrect answers. EDC staff claims that this behaviour has abated since the introduction of the FQEL project.
- **Enjoyment of Learning:** In addition to respect, good manners, and equitable interaction, the program makes learning fun for both teachers and students.

Dual Audience Direct Instruction

Interactive radio instruction and interactive television instruction are examples of dual audience direct instruction. Programs are broadcast into the classroom, directed at students, but also directly guide the teacher to take a more active instructional approach than would otherwise be the case. The classroom teacher and the radio or television “teacher” co-teach students but the classroom teacher and students are also co-learners. Successful examples of this approach include interactive radio instruction (IRI) and Mexico’s *Telesecundaria* program (interactive television-supported instruction).

Sous le Fromager is arguably the main professional development component provided to all Guinean primary school teachers in the FQEL project. It is supplemented by two additional ICT-based TPD interventions.

(2) Radio Broadcasts for Teachers

Pas à Pas is a weekly, radio broadcast designed to improve teachers’ instructional skills. The program, 30 minutes in length, offers a simulated teaching episode, followed by instructional strategies, formative assessment, and teachers talking together and evaluating the lesson that just occurred in an effort to model reflective practice. Like *Sous le Fromager*, *Pas à Pas* has a number of characters who reappear throughout the program, including two radio personalities who communicate with each other.

Pas à Pas listenership is low— on average 30 percent of teachers listen to any one program. Several factors contribute to this low rate of listenership. First, teachers are not mandated to listen to *Pas à Pas* and, unlike *Sous le Fromager*, there is no formal structure within schools for

them to do so. Indeed, the program is broadcast on Thursday afternoons when teachers are not in school^{vi} and during a time (3:30 PM) when the quality of reception is weakest due to solar interference. Another factor for the low listenership rate may be the heavy narrative nature of the program. It is not as engaging, multimodal, entertaining or as interactive as *Sous le Fromager*—nor was it designed to be. Yet, every teacher interviewed for this case study expressed a preference for *Sous le Fromager* over *Pas à Pas*, citing the former as more beneficial to their professional development than the latter.

Nonetheless, the content of *Pas à Pas* finds its way into the third form of ICT-based teacher professional development—face-to-face TPD that uses print and audio-based instructional aids for teachers.

(3) Site-based Face-to-Face TPD

In addition to *Sous le Fromager* and *Pas à Pas*, primary school teachers participate in 60 hours of ongoing professional development over the course of the school year. Teachers from local schools come together in bi-monthly professional development days and *cercles de renforcement* to focus on areas of pre-determined teacher need and to receive “re-enforcement” in lesson planning, assessment and instruction.

Cercles de renforcement are conducted by one of Guinea’s 425 Délégués Scolaire d’Education Elémentaire (DSEE) or by assistant DSEEs, charged with teacher training by the Ministry of Education. Before the FQEL project, the DSEE had neither the materials nor the capacity to carry out TPD. To better equip them to conduct teacher professional development, FQEL staff were provided 3 days per year of face-to-face professional development as well as a teacher training “kit” that used print-based professional development guides and audiotapes of “the best of” *Pas à Pas* segments that focused on particular targeted areas of instruction. DSEE and were trained in the use of these print and audio-based materials as well as TPD strategies, employing these kits in the *cercles de renforcement*.^{vii}

Producing Sous le Fromager

Though IRI is considered a low cost delivery system, it is in fact expensive to produce, with combined production costs for *Sous le Fromager* and *Pas à Pas* at about \$2 million (US), funded by an external donor (USAID). The Institut National de Recherche et Action Pédagogique (INRAP) produced, wrote, field tested, recorded all radio programs. The process is a long one, involving the following steps:

- Examining the national curriculum
- Creating a master plan of activities indexed to curricular goals
- Script writing (typically 3 days for one 30-minute episode)
- Recording a broadcast
- Field testing each broadcast with teachers and students
- Revising broadcasts based on feedback
- Final production and distribution to Guinea’s FM national radio station

Such production demands the involvement of a host of players—educators, curriculum specialists, instructional specialists, radio actors, musicians, broadcast production specialists, evaluators, teachers and students. Formative evaluation of radio programs was cited by program staff as the critical element to the program’s success. Every episode of *Sous le Fromager* was field tested before an audience of teachers and students with evaluators observing student and teacher reactions to the program based on indicators of clarity, comprehensibility and engagement. Teachers and students were then interviewed upon conclusion of the field test, asked to evaluate the program and offer suggestions for its improvement. Their suggestions were incorporated into a revised version of the episode.

Guinea's FM radio station broadcast each program until the 2004-2005 school year when the three Ministries that oversaw *Sous le Fromager*—Education, Finance and Communications—were unable to provide funding for its continued broadcast. As a result of World Bank intervention, programs resumed once again, in April 2005, on five rural radio stations, and are scheduled to continue in 2005-2006, using the rural radio network and increasing the number of stations that broadcast *Sous le Fromager*.

Impact of *Sous le Fromager* within the Classroom

The FQEL project ended in July 2005, and final evaluation data are not yet available as of this writing. Preliminary data, based primarily on teacher and FQEL staff interviews, and some pre- and post-test student data, do indicate, however, that *Sous le Fromager* has had a positive impact in a number of specific EFA-related as well as general educational areas:



A teacher calls on students as prompted by the radio “teacher.”

- **Improved teacher content knowledge:** In interviews conducted for this case study, when asked how *Sous le Fromager* helped their classroom practice, teachers almost always first cited the improvement in their own content skills. As an example, in one Conakry primary school, several teachers commented that the radio lesson just observed (which focused in part on helping students understand the distinction between the French prepositions “sous” and “sur” (“under” and “on/over”)) had actually helped them understand these same concepts.
- **Increased student attendance rates:** Principals, teachers and FQEL staff interviewed for this case study report that school attendance increases on “radio days.”
- **Increased math and French-language ability** in grades two, four and six, as indicated via data derived from pre- and post-test comparisons.^{viii}

- **Improved teacher quality:** DSEE, FQEL staff, administrators and teachers themselves interviewed for this case study report an increase in more active learning strategies as a result of *Sous le Fromager*. EDC staff reports that teachers generally take a more developmental approach toward learning—focusing now on providing smaller amounts of information over several days, rather than transmitting a large quantity of knowledge in one class period.

Based on interviews with FQEL staff and with teachers themselves, it appears that the shift toward a more active pedagogy has had a cumulative effect with teachers transferring some of the skills learned in “IRI classes” to “non-IRI classes.” When prompted by the interviewer, for an example of this transference, one sixth grade teacher reported that, as a result of *Sous le Fromager*, he set up a project-based activity for students in which they created a water filtration system.

- **Changing teacher attitudes and roles:** EDC staff and one of the project’s evaluators^{ix} report that though at first quite resistant to using IRI, teachers are now generally receptive toward and enthusiastic about *Sous le Fromager* and the instructional changes that accompany its use. Two male teachers interviewed for this case study admitted to initial resistance on their part but both claimed to enjoy using IRI as part of instruction and credited it with improving their teaching.

I thought, I am the man of the class, I am the teacher. Why would I use the radio? The students will laugh at me.

Primary School Teacher, Conakry, Guinea

- **Standardization** of instruction and teaching materials and, where students can receive a radio signal, *equal access* to content and instruction
- **Benefits to rural students:** An evaluation conducted by Creative Associates reveals that *Sous le Fromager* has had a particularly positive impact on the French and math abilities of rural students, who comprise 80 percent of the *Sous le Fromager* audience.^x

Radio and EFA Goals: Access, Quality and Instruction

IRI helps to address the three large issues facing Guinean education—access, teacher quality and instructional quality, supporting Guinea’s efforts to attain *Education for All* goals.

Access and quality. *Sous le Fromager* helps to address Guinea’s teacher education “gap.” As its gross primary school enrolment rates have increased from 56 percent to 80 percent, the country faces an annual teacher shortage of 1600 to 2000 teachers.^{xi} While in the past, teachers needed 13 years of schooling (Grade 10 plus three years of teacher training at an Ecole Normale), that qualification has been reduced to a simple baccalaureate (12 years of school) followed by a 12 month campus-based pre-service program, and in many areas, even less. Therefore, in-service teacher professional development is a main thrust of government educational efforts and *Sous le Fromager* and face-to-face professional development help with this.

Teacher quality. *Sous le Fromager* is an example of in-class direct instruction for teachers but the formal professional development component that accompanies it complements the in-class TPD experience. While *Sous le Fromager* scaffolds more active instructional practices and focuses on teacher content skills and affect (understanding what it is like to be a learner), *cercles de renforcement* can help teachers with planning and assessment and provide opportunities for formal and informal learning. Both in-class radio and *cercles de renforcement* can help to address teachers’ content and instructional skills and provide them with basic teaching skills.

Engaging. *Sous le Fromager* is also an engaging and entertaining program in a country with little television and few computers. Adults can be heard whistling musical tunes from *Sous le Fromager* and students return home with information about the importance of washing one’s hands and other public health information.^{xii} Communities have picked up a lot of the recurrent costs of IRI (batteries, radios, maintenance costs, tapes) and small radio repair shops have sprung up around primary schools.

Addresses contextual needs. Most of all, IRI is a form of ICT that best makes sense for a country like Guinea—a nation with a shortage of teachers with even basic qualifications, a nation with low teledensity, poor electricity infrastructure outside of Conakry, and school structures that could never house a computer or television. Radio is portable, wireless (in the original sense of the term), easy to learn and already part of the technology landscape—indeed, radio is ubiquitous within Guinea. By building upon a medium with which teachers are familiar,

FQEL has truly achieved technology integration—a classroom based use of technology in which the focus is, not on figuring out the tool, but on the knowledge it conveys, and a technology that truly helps students and teachers learn better and in ways that would be otherwise impossible.

Challenges Associated with IRI

As the technology sections of the Handbook have indicated, there are a number of challenges associated with any ICT tool used for TPD— in particular with broadcast tools. Indeed, the strengths of the broadcast medium are also often its weaknesses.^{xiii} The weaknesses of IRI are outlined below.

IRI is dependent upon on national infrastructure. IRI depends upon government or private radio transmission for its dissemination to schools and when that is lacking, as during the 2004-2005 school year in Guinea, IRI (and a substantial portion of TPD) is halted. As noted earlier, *Sous le Fromager* was not broadcast on FM radio during the 2004-2005 school year. When broadcasts resumed in spring 2005 on Radio Rurale (a short wave alternative to the national FM radio) broadcasts occurred at 1:30 PM, thus bypassing students in the morning shift of school. Additionally, Radio Rurale's coverage is limited as a result of its weak transmitters and solar interference.

There are ways around this problem. Many schools circumvented the transmission difficulties of the 2004-2005 school year by previously recording the program and copying, selling or sharing their *Sous le Fromager* library with neighboring schools, but audiotapes have proved a more costly and fragile alternative to radio (Audiocassettes must be purchased and are easily lost or damaged). INRAP has begun to produce audio kits of *Sous le Fromager* but thus far only 126 such kits are available—for 7,000 primary schools.^{xiv} A possible alternative to the unreliability of broadcasting on a national radio station is the creation of a dedicated educational radio station which would allow the program to be broadcast several times a day.

Broadcast does not mean access or actual listenership in schools. Even if radio reception is good, broadcasting IRI does not mean schools and teachers will hear it. Eighty-five percent of Conakry's schools are private, employ a very traditional curriculum, and do not utilize *Sous le Fromager*,^{xv} thus limiting listenership in Guinea's largest population center. In spite of the stated popularity of the program there is some degree of non-compliance on the part of teachers, particularly older male teachers.^{xvi} And equipment issues also impede access. The first generation of radios was windup radios, 40 percent of which broke after 3 years of continuous use. Now on its third generation of radio distribution, newer windup radios promise to be more durable (the winder cannot be reversed and thus broken as in first and second-generation windup radios), but if radios are lost and damaged, schools must purchase their own batteries, radios, and increasingly, cassette recorders and audiotapes.

IRI is vulnerable to the political climate. As Guinea's difficulties broadcasting *Sous le Fromager* illustrate, IRI can be positively or negatively impacted by the political climate in which it operates. In essence, radio depends upon political good will for its continued operation. This makes teacher professional development far more vulnerable to external political and macro economic factors than is the case with other types of ICT-embedded TPD.

Additionally, like many well-received programs, *Sous le Fromager* suffers from sustainability concerns. The program ended in July 2005 and though the Government of Guinea and INRAP have promised to keep it alive, there is concern about the Government's capacity to do so, especially since the program will need to be revised in light of Guinea's new curriculum, which is set to be implemented in 2008.

IRI is only as good as the curriculum it delivers. At its core, IRI is a delivery mechanism vehicle through which the national curriculum is conveyed. Guinea's national curriculum is still quite teacher-centered and focused on rote learning, and *Sous le Fromager* reflects much of this approach, in spite of efforts to the contrary. Every question posed by the radio teacher or

in-class teacher involved a right and wrong answer and questions probed “lower order “skills (recall, recognition, identification).

IRI can still promote watered down instruction. IRI is often termed “learner centered” but such an interpretation is open to debate. Though FQEL documents report the use of nine instructional strategies (See p. 2), most activities observed—albeit in a handful of classroom observations—tended to focus on instructional activities that still could be considered traditional (individual work, whole class recitation, some pair sharing, students working at the chalk board, some problem solving). In the continuum of learner-centered and teacher-centered instruction, *Sous le Fromager* occupies a middle ground, a transition between a teacher-centered and learner-centered methods. Though students are more physically active and instruction is differentiated as much, and as feasibly as possible, in some instances, the program merely replaces the in-class teacher with a radio teacher, continuing the same dynamic of the teacher as ultimate authority and student as a more passive participant in his/her learning.

IRI does not address teacher literacy issues, which are Guinea’s most pressing teacher need. Most critically, interactive radio instruction, as implemented right now, does little to address the greatest need facing Guinea’s teachers—helping them to learn to read—and this was never the intention of the FQEL project. However, teacher illiteracy and low levels of literacy were cited time and again in interviews as the most pressing issue facing Guinea’s teachers. Policymakers may wish to consider whether and how IRI, alone and with other types of ICT and non-ICT-based instruction, to help teachers build basic literacy skills.

What are the implications of these critiques for policymakers? First, that radio—like any broadcast medium—is vulnerable to external forces (politics, federal budgets, transmission capabilities) that extend beyond the capabilities of ICT for TPD projects.

Next, radio—while an effective TPD tool to help teachers gain the *basics* in curriculum, content and instructional skills—soon exhausts its capabilities because of the limitations of largely passive broadcast media. If teachers are to move beyond basic skills in instruction toward more intermediate or advanced skills, other types of professional development—with or without ICTs will need to be employed. If this TPD is to involve ICTs, those technology tools (video, for example) must be used in concert with TPD approaches that promote more advanced instructional skills.

Radio as a TPD Tool

Radio is by no means a silver bullet for building teacher quality—no technology is—and radio certainly suffers from factors (cost, transmission capabilities) that impact its reach and effectiveness. Yet radio, and audiotapes, within the context of Guinea, are excellent examples of when ICT should be used in teacher professional development in environments as taxed as that of Guinea. In the case of Guinea, radio (and audio) make TPD possible—it would be otherwise impossible to reach so many teachers without radio—and because they make it better. Teachers are provided with in-class instruction and assistance that is curriculum based, grounded to some degree in learner centered approaches and active pedagogy, and supplemented by ongoing instruction.

For those considering the use of radio and audio as TPD tools, how and when should they be used? They should be used in very low resource environments when the goal is to provide the most basic skills training to unqualified teachers and when these ICT tools can:^{xvii}

- **Provide access to continuous learning:** Radio and audiotaped instruction have provided Guinean teachers with ongoing, sustained, and low cost “anytime-anyplace” access to learning and have been effective TPD tools and effective follow-up tools helping teachers implement innovations in their classrooms.
- **Broaden exposure to instructional practices:** Radio and audiotapes have allowed teachers to experience and create different new instructional practices in their classrooms.

- **Address teachers' content knowledge:** Through radio, teachers and their students have been provided content which teachers, which they and FQEL staff claim, has helped improve their content knowledge.
- **Promote reflection about teaching:** Through *Pas à Pas*, when used as part of professional development in cercles de renforcement, teachers are exposed to other types of classroom instruction, listen to discussions around classroom practice, and engage in reflection and discussion around specific teaching practices. This continuous discussion *can* (though there is no evidence that it has) foster learning communities in which teachers share ideas, reflections, and resources.
- **Provide curriculum and content supports:** Radio provides teachers with access to teaching and learning resources and ideas in French, math and science, that would otherwise be unavailable.
- **Lend themselves to easy integration within the classroom:** The ultimate goal of any instructional use of ICT should be integration and IRI achieves this. It is present *in the teacher's classroom* (she need not travel to a computer lab or resource center). It is *simple to use*—teachers need little training in learning how to use or maintain radio, instead focusing their energies on content and instruction). It serves the curriculum, in fact making curriculum delivery possible. It provides an observable advantage to teachers and to students, engaging teachers and students in learning, and providing continuous on-site, in-class teacher support.

Expanding IRI as a Teacher Professional Development Tool

IRI has been primarily directed toward students and yet appears to possess positive teacher benefits. It is fair to say that benefits could be even more positive if used explicitly as a teacher professional development approach. Along with print-based materials and a personal intermediary, radio could be used to teach basic literacy skills to teachers. By altering broadcast lengths, developing more open-ended questions and building in teacher work time, radio could be used to develop higher order skills among teachers. It remains to be seen if this will occur once Guinea unveils its new curriculum, which is supposed to focus on higher order cognitive skills.

The use of radio with more multimodal and visual technologies—Internet-based video, CD-ROM-based information, computer aided instruction or even computer-based Office tools—promises even greater professional learning opportunities for teachers as the direct instruction of IRI can be supplemented with actually viewing **other teachers' classrooms, accessing information and lesson plans, practicing basic literacy and numeracy skills** in a compute-based tutorial program, and developing their own lesson plans. The dual audience direct instruction approach of IRI can also be used with other professional development approaches listed in the Implementation Briefs. This blending of professional development approaches can help teachers migrate from basic skills to attaining more advanced skills in the core areas of teaching—content, instruction, curriculum and assessment.

Recommendations: When to Use Radio

Section 3 of the Handbook provides detail on the effective uses of radio as a TPD tool. It is worth repeating that like any technology, radio is most effective when it addresses a particular set of circumstances:

- To impart *basic* skills (of some degree of literacy, numeracy, national language skills, content skills) to teachers or students.
- In areas where no or few qualified teachers are available. Radio in essence can serve as a “master teacher” or mentor for community volunteers or para-professionals who serve in place of teachers.
- To address the needs of hard to reach populations (teachers and students in remote geographic regions, areas of conflict, home bound audiences (teachers and students suffering from illness), or linguistic minority groups (assuming there is the capability to produce radio programs in these languages)
- In extremely low-resource, low infrastructure environment where capital costs can be absorbed by donor agencies and/or where Ministries of Education can absorb radio’s low recurrent costs
- Where radio production, curriculum development and writing skills exist
- When the goal is educational *access and equity*

Most important, radio often represents the *first* phase in ICT for teacher professional development. Once teachers have a set of basic instructional and content skills, TPD programs may wish to utilize other type of ICTs (stand alone and networked computers, for example) to address teachers’ evolving skills.

Acknowledgements

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Endnotes

ⁱ Personal communication. Rebecca Rhodes, Education Development Center, Washington, DC, May 11, 2005 and Ramatoulaye Diallo, University of Conakry, June 15, 2005.

ⁱⁱ Listenership since the start of the broadcast has averaged 85 percent. However, in 2004-2005 as a result of the Ministry of Education’s ability to broadcast the programs on national radio, listenership levels dropped to 60 to 70 percent.

ⁱⁱⁱ Terms are translated from French. Some may not be exact the English equivalent of the terms used in USAID or EDC documents.

^{iv} Ministry of Science, Education and Technology. (2005). *ICT in Education Options*, p. 15. Nairobi: Government of Kenya.

^v Gardner, H. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.

^{vi} Teachers generally use that day to attend face-to face professional development, to participate in co-planning sessions with other teachers, or to take care of household chores. E-mail communication. Helen Boyle, Education Development Center, Washington, D.C. October 6, 2005.

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- ^{vii} Personal communication. Norma Evans, FQEL Education Advisor, Conakry, Guinea. June 15, 2005.
- ^{viii} Personal communication. Rebecca Rhodes, Education Development Center, Washington, DC, May 2005.
- ^{ix} Personal communication. Ramatoulaye Diallo, University of Conakry, June 15, 2005.
- ^x Personal communication. Natasha Macken, United States Agency for International Development (USAID), Conakry, Guinea, June 15, 2005.
- ^{xi} Personal communication, Thierno Diallo, Assistant Director, Education pour Tous (EPT), Conakry, Guinea. June 18, 2005.
- ^{xii} Personal communication. Rebecca Rhodes, Education Development Center, Washington, DC, May 2005; Norma Evans, FQEL Education Advisor, Conakry, Guinea. June 15, 2005.
- ^{xiii} Personal communication. Helen Boyle, Education Development Center, Conakry, Guinea. June 17, 2005.
- ^{xiv} Personal communication. Amadou Diallo, National Institute for Pedagogical Research and Action (INRAP), Conakry, Guinea, June 15, 2005.
- ^{xv} E-mail communication. Helen Boyle, Education Development Center, Washington, D.C. October 6, 2005.
- ^{xvi} Personal communication. Ramatoulaye Diallo, University of Conakry, June 15, 2005.
- ^{xvii} Part of this framework is adapted from Capper, J. (2003). *Uses Of Technology to Support High Quality Teacher Professional Development*, p. 2. Available at: <http://topics.developmentgateway.org>.