



# Tikwere Final Report

Cooperative Agreement #690-A-00-07-00020-00

May 2007 to September 2012



**USAID**  
FROM THE AMERICAN PEOPLE

**EDC** Learning  
transforms  
lives.

## List of Acronyms

CBE	Complementary Basic Education
CCTV	Closed Circuit Camera Television
CDs	Compact Discs
CoP	Chief of Party
CPD	Continuous Professional Development
DAPP	Development from People to People
DCOP	Deputy Chief of Party
DEM	District Education Manager
EA	Education Advisor
EDC	Education Development Center
EDM	Education Division Manager
HIV/AIDS	Human Immune Virus/Acquired Immune Deficiency Syndrome
HQs	Headquarters
IAI	Interactive Audio Instructions
IRIAs	Interactive Radio Instructions Advisors
IRI	Interactive Radio Instructions
IPTE	Initial Primary Teacher Education
MBC	Malawi Broadcasting Corporation
MCDE	Malawi College of Distance Education
M&E	Monitoring and Evaluation
MoEST	Ministry of Education Science and Technology
MTPDS	Malawi Teachers Professional Development Support
ODL	Open and Distance Learning
PCAR	Primary Curriculum and Assessment Reform
PEA	Primary Education Advisor
P2P	Peer to Peer
SMS	Short Message System
S1	Standard One
S2	Standard Two
S3	Standard Three
S4	Standard Four

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## Executive Summary

From 2007 to 2012 Tikwere! produced and broadcasted IRI programs for Standards 1-4, Open and Distance Learning for teacher trainees, audio programs for IPTE (teacher training), Continuous Professional Development (CPD) and Year 1 Complementary Basic Education (CBE). Tikwere! also tested new and potentially promising educational technologies. Some of them include playback methods, while others intended to expand opportunities for teachers and learners to access the existing content in a more sensory rich way. Tikwere! was tasked with taking greater strides with our ministry partner, the Malawi College of Distance Education (MCDE) and in doing so we worked with them to develop a Capacity Development Plan and later, a Sustainability Plan for continued IRI implementation.

The project achieved its objectives. Standard 1-4 programs are continuing to be broadcast on MBC through an agreement between MCDE and MBC. CBE programs are complete and ready for Malawi government implementation and ODL, CPD, CBE and Standard 4 guides have been distributed nationwide. To do this, Tikwere has worked with all local printers, Supplies Unit; the government deliveries arm and a variety of private warehouses and shipping companies. During the course of the project, we trained, on average, close to 25,000 teachers a year and over 2.7 million listeners tuned in to the program this year. To complement radio and audio programs, almost over 90,000 audio/radio guides were produced and distributed and just under 23,600 radios were delivered to public schools nationwide.

Learning gains for the project were quite good. Standard 1 learners averaged 9.58% gains against control sites found in the broadcast shadow with English and math gains at over 10 percent. The broadcast shadow comes from geographic pockets MBC cannot reach due to the topography in Malawi. Despite this, teachers, through participation in IRI, learned and practiced teaching methodologies promoted through the New Primary Curriculum (NPC.). Interactive instruction, developed for Malawi, offer teachers the opportunity to test new ways to teach in

overcrowded classrooms. In fact, veteran teachers were nostalgic, as they recalled radio instruction in the past decades and new teachers enthusiastically embraced this exciting new participatory approach that netted real gains in the classroom.

Interactive Radio Instruction (IRI) is based on up on the belief that music, lively characters in recognizable settings and most importantly lessons that engage learners through interaction can improve classroom instruction. Learners are encouraged to use multiple senses and teachers are led through new teaching techniques. Together, teachers and learners have a “taste” of the child-centered strategies that the curriculum promotes. Finally, the teachers, spurred on through the success of the radio lesson, are more apt to repeat the same strategies throughout the learning day.

As with all IRI projects, Tikwere! was based on rigorous evaluation and monitoring. A system of formative evaluation and teacher feedback shaped the programs as we continued to expand to new standards. The twice yearly PEA and Peer to Peer trainings was a forum for providing feedback to the project on what was educators found useful and what improvement should be made. Ministry officials, EDMs and DEMs also had the opportunity to air their observations during annual meetings. The meetings included questions on how best ministry personnel could sustain the project. It was indeed at these meetings that the Ministry began to consider MCDE staffing needs.

In March 2010, Tikwere received an extension to continue producing IRI programs for elementary schools and create additional programs for populations within the education community that were at present, underserved. The extension created a mandate to produce IRI/IAI for Standard 4, Continuous Professional Development (CPD,) programs for in-service teachers, programs for out-of-school youth under Complementary Basic Education (CBE) GIZ created, Open and Distance Learning (ODL) for student teachers and IPTE teacher trainee lessons for Teacher Training Colleges. We procured and distributed 10,000 additional radios to meet the challenge of sharing among different standards and most importantly perhaps to address the needs of large class sizes. To improve sustainability, we also developed a system

to locally service radios through a standardized radio repair system. School districts no longer have to rely on a central system that included transporting radios to MCDE in Blantyre and waiting for new or refurbished radios to return to their school. Now local funds go to immediately repair and return radios. Radio repairers use a pre-determined rate for radio repair and most importantly learners get working radios back in their classrooms in shorter period of time.

Finally, we were asked to develop a Capacity Development Plan that would create a roadmap for MCDE. Tikwere! worked closely with MCDE to align their government structures of position descriptions and hierarchy with the needs of continued IRI delivery, and we hope, IRI production. Together with MCDE and later with an outside consultant and the larger ministry of education, we developed these two plans based on MCDE's current and future needs. Such a capacity development approach of working closely with the MCDE provided the two organizations a chance to fully appreciate each other's ability, potential and challenges. Understanding the MCDE's history was essential to recommend procedures and policies that would fit into the government system.

First and foremost, MCDE needed to recruit staff. This recruitment, however hinged on budget and timing. Government funding, earmarked for broadcasting only, had to be increase mid-season and in order to do so the Education Planning Directorate would have to substantially increase funding from MK8 million to MK124 million. This amount reflected the very many activities Tikwere engages in to ensure quality and this was realized regular meetings with MCDE. Through meeting with MCDE, Tikwere was able to express the critical areas necessary to fund if the project was to be sustained.

Until the ministry could allocate new staff, Tikwere and MCDE worked together to solve how best to utilize the limited MCDE staff. Questions of institutional memory and technical skills development were key to sustainability. The Monitoring and Evaluation team, at least received a willing and curious counterpart. She was given opportunities to prepare reports and conduct statistical analyses. The project used selected PEAs and teachers: Every school now has a key

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Tikwere! teacher who is expected to help colleagues understand how to use the programs. The project, we believe, has left a legacy of local education officials – Teachers and PEAs – who create solutions through their own experience with the programs. Replacing studio producers, however, remained a challenge. Some of our current producers have applied for positions within MCDE. However, at this writing, no recruitment has been completed. Currently MCDE has one year to make the change. All programs have been recorded and can be replayed yearly up to Standard 4. If, though, MCDE intends to produce programs beyond year 4 or make revisions to any of the programs, this will be delayed by a studio that remains dark. We hope that scriptwriters and others, employed by EDC will be hired to work for MCDE. This way, MCDE will have the requisite skills while building upon the institutional memory established through Tikwere.

One hundred and twenty Complementary Basic Education programs (CBE) were produced in 2011. The sites for implementing the interactive audio programs were, at the time of the extension, to be selected and facilitators identified. We fully expected that sites would be established in time for formative evaluation. Instead, until sites were identified, Samaritan Trust, graciously accepted to serve as the formative evaluation site and continue through to the end of the project. Teachers and learners were unsure what this would produce, but in the end, the excitement and enthusiasm for learning surpassed all our expectations. MCDE received the full complement of 90 learner programs and 30 facilitator programs. We expect that these will be replicated and used in the six districts the MoEST initially identified; Chikwawa, Mwanza, Salima, Ntchisi, Phalombe and Kasungu. Over the course of formatively evaluating programs and orienting facilitators we learned of the impact CBE had on the lives of young people. The target audience; out of school youth wishing to complete their studies, were able to keep pace, showed great enthusiasm and expressed a desire for more time with English language instruction and other basic skills. These youth, were able to make the connection between basic skills instruction and livelihoods. We are therefore recommending that the MoEST develop a level two CBE audio program to complement the DBE Level 1 program Tikwere was able to produce and MCDE will be able to install.

In the last year of the project, we were approved to create a supplementary book for Standard 4 (Pamchenga's Treasure). As part of our last reprogramming, we suggested that we develop a book to complement S4 programs. The purpose was to complement books already created through READ Malawi and to provide additional opportunities to practice English literacy skills. The story, created by two Tikwere writers, was born out a design workshop for the S4 programs. The story and characters are identical to those in the IRI programs and the study questions and vocabulary were pulled from the S4 Teachers and Learners' books. During our pre-development stage, during monitoring visits and during teacher training the monitoring teams had observed that in large part Malawi S4 learners lack a mastery of English. Once USAID/Malawi Office accepted our proposal, we created a supplementary reader that would enhance learners' language competency. Six hundred thousand (600,000) copies of the reader were produced in 3 months. That means, the book was developed, edited, illustrated and printed in only ninety days. The draft underwent a series of edits with the Education Advisor, Deputy Chief of Party, Chief of Party and scriptwriters all participating in the book's development. Nationwide distribution to all public school S4 learners was completed and verified. This book reflects the importance of giving individual learners the opportunity to take ownership of their own copy, read together with the classmates over the course of the year and discuss age appropriate Life Skills issues.

By 2012, Tikwere was reaching 2,724,633 learners in public schools in Malawi through S1, S2, S3 and S4 programs. The shadow areas where the MBC signal could not reach implored us to find alternative avenues to listen to the programs. Experimenting with SABERs, Tikwere investigated the use of robust MP3players as a broadcast alternative. This was only one of the possibilities we explored in our Alternative Technologies Pilot. The Pilot sought to explore different delivery systems as well as new types of content which could either enhance our target audience's ability to access content: Video IRI can complement radio IRI by using short bursts of video to elaborate on difficult to explain topics, the Ipad in the hands of young learners can increase contact time for rote practice through gaming, CPD videos hold a mirror to teacher

practices for analysis and development and finally, local CBE centers could use sturdy MP3 players as a playback option for audio instruction.

The pilot offered us the opportunity to explore not only the technology, but to conduct a cost-benefit analysis of the durability, cost and educationally appropriate use of the technology. All of this, of course was couched in what can and cannot work for Malawi. Indeed, the findings showed that the CPD videos, iPad and the Saber are workable solutions. The cost implications will have to be fully weighed against the option of cheaper alternatives. Nonetheless, the iPad or similar tablet, seem an attractive possibility in terms of improving learning. The Saber was left with the MCDE to follow through and verify if it is a plausible technology for CBE and other audio lessons.

The project provided a major lesson for Malawi: Radio is still the champion of audio lessons in a developing country. Interactive radio and interactive audio still deliver a multitude of benefits; lesson introduction (PCAR), engaging lessons (interactive), increases in student competency (learning gains), staff development (teacher interactions) standard lesson delivery (eliminating rural/urban and gender gap). It proved to be appropriate for young children as well as adults. Delivers training, assists tutors, test prep (ODL) The radio invites communities to a greater appreciation of school issues simply by tuning in. Trained or un-trained, primary school teachers, can increase their efficacy through interactive radio. In the case of teacher trainees in the Open and Distance Learning program, ODL radio programs were often the main companions guiding teachers in assignments and preparing for examinations. Tikwere's success with ODL and the relative little resources in this domain make the argument that if Malawi were to continue with ODL teacher training the radio/audio trainings would be a powerful means to teachers in practica with the Teacher Training College materials.

## Tikwere! Results by Indicator

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
1. Number of primary school students enrolled in TIKWERE! targeted schools	Results in EMIS Reports	2008	860,000	863,873 S1	1,433,000 F=728,348 M=704,652	1,543,374 F= 778,292 M= 765,082 S1+S2	2,132,472 F=1,072,273 M=1,060,199	2,133,729 F=1,072,905 M=1,060,824 S1+S2+S3	2,132,472 F=1,072,273 M=1,060,199	2,220,494 F=1,120,999 M=1,099,495 S1+S2+S3	2,536,078 F=1,280,319 M=1,255,759	2,724,633 F=1,375,510 M=1,349,123 S1+S2+S3+S4
2. Number of learners in Complementary Basic Education (CBE) Centers benefitting from IRI disaggregated by males and females	CBE Attendance Registers and Reports	2010									900	Govt delayed roll-out of CBE. Programs were developed and staff deployed, facilitators trained in preparation for roll out.
3a. Mean gain scores <sup>1</sup> on local language literacy, numeracy, and English Language tests	Learner scores (Pre- & Post-Test)	2008 (S1- 4)	10% average gain of treatment over control in each subject for S1	S1 <u>Chichewa:</u> 7.8% <u>Maths:</u> 10.9% <u>English:</u> 4.9% Avg = 7.87%	10% average gain of treatment over control in each subject for S1 & 2 learners	S1 <u>Chichewa:</u> 8.73% <u>Maths:</u> 14.65% <u>English:</u> 16.84% Avg =13.41%	Transitioning from Phase 1 (May 2007 to Feb 2010) to Phase 2 (March 2010 to September 2012) as such, learner assessment planned for Phase 2.	10% average gain of treatment over control in each subject for S1 & 3 learners	S1 <u>Chichewa:</u> 5.39% <u>Maths:</u> 7.23% <u>English:</u> 9.72% Avg = 7.45%	10% average gain of treatment over control in each subject for S1 & 3 learners	S2 <u>Chichewa:</u> 6.02 <u>Maths:</u> 8.56 <u>English:</u> 4.08% Avg = 6.22	

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
						S2 Chichewa: 12.51% Maths: 9.57% English: 14.63% Avg = 12.23				S3 Chichewa: 5.93% Maths: 6.60% English: 5.43% Avg = 5.99		S4 Chichewa: 4.86 Maths: 8.25 English: 5.97% Avg = 6.36
3b. Mean gain scores <sup>2</sup> on local language literacy, numeracy, and English Language tests	Learner scores (Pre- & Post-Test)	2010  CBE									5% average gain of treatment over control in each subject for CBE learners	Refer to Indicator 2 above on CBE.
4. Number of teachers trained in IRI			7000	7800	14,900 F= 6841 M= 8059	14,630 F= 6,659 M= 7,971	22,630 F=10,301 M=12,329	Sept. 2010 22,677 F=10,322 M=12,355  Dec 2010 27,365 F=11,170, M=16,195	30,630 F=13,942 M=16,688	Sept. 2011 39,191 F=15,696 M=23,495  Dec. 2011 37,976 F=15,301 M=22,675		
5. Number of teacher trainees trained by IRI in pedagogy	Enrolment figures from TTCs	2011							6,000	7,984 M=4,809, F=3,175	10,000	13500 (5500 (ODL) + 8000 Conventional)

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
6. Number of MoEST officials and administrators and other officials trained in IRI and related skills	Training Reports (PEAs & Desk Officers for Primary Education (DoPE) & Divisional officials)	2010		460 F= 78 M=382 (PEAs were trained with teachers though not targeted audience)		460 F= 78 M=382 (PEAs were trained with teachers though not targeted audience)		460 F= 78 M=382		460 F= 78 M=382		460 F= 78 M=382
								<u>Aug.2010</u> 467 F=79 M=388  <u>Dec.2010</u> 534 F=177 M=366		<u>May.2011</u> 544 F=205 M=339  <u>Aug.2011</u> 546 F=181 M=365  <u>Dec.2011</u> 543 F=177 M=366		<u>Apr.2012</u> 531 F=167 M=364
	Training Reports (DEMs & EDMs)	2008	40	40 F=6 M=34	40	40 F=6 M=34	40	40 F=6 M=34	40	40 F=6 M=34	40	40 F=6 M=34
Training Reports (MCDE Officials) <sup>3</sup>	2008	12	12 F=6 M=6	12	12 F=6 M=6	12	12 F=6 M=6	12	11 F=6 M=5	12	11 F=6 M=5	

<sup>3</sup> The same MCDE tutors were trained in IRI and related skills as well as M & E as stipulated Indicator 11

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
7. Number of audio & video programs produced and disseminated		S1 (2008)	150 Produced and disseminated	160 Produced and disseminated	150 Disseminated	150 Disseminated	150 Disseminated	150 <sup>4</sup> Disseminated	150 Disseminated	150 Disseminated	150 Revised and Disseminated	150 Revised 147 <sup>5</sup> Disseminated
		S2 (2009)			150 Produced and disseminated	150 Produced and disseminated	150 Disseminated	150 Disseminated	150 Disseminated	150 Disseminated	150 Disseminated	147 Disseminated
		S3 (2010)					150 Produced and disseminated	150 Produced and disseminated	150 Disseminated	150 Disseminated	150 Disseminated	147 Disseminated
		S4 (2011)									150 Produced and disseminated	150 Produced 147 disseminated
		CBE (2011)									120 90 learner 30 facilitator programs produced and disseminated	120 90 learner programs 30 facilitator programs produced
		CPD (2010)							24 Year 1 Programs	24 Year 1 Programs	24 Year 2 Programs	24 Year 2 Programs
		ODL (2010)							24 Year 1 Programs	24 Year 1 Programs	24 Year 2 Programs	24 Year 2 Programs
		TTC (2011)									17 Produced and distributed	17 Produced and distributed
		CPD Video (2011)									6 Produced and Pilot-tested	6 Produced and Pilot-tested

<sup>4</sup> MoEST through MCDE started paying for airing programs at MBC starting with S1 in 2010 adding one class each year and in 2012-2013 took over payment for all S1-4 & ODL programs

<sup>5</sup> In 2012, 147 programs were disseminated out of the produced 150 because of the Industrial action at EDC offices leading to failure to broadcast 3 programs for each class (S1-4)

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
		S4 Visual IRI (2011)									10 Produced and Pilot-tested	10 Produced and Pilot-tested
8. Number of teacher's guides, radios and other teaching and learning materials provided with USG assistance	Delivery notes	Radios 2008	10,000 Purchased and distributed	10,000 purchased 9,052 Distributed	0	450 <sup>6</sup> Distributed	3,000 Purchased and Distributed	3000 purchased, 600 received via donation 4,098 <sup>7</sup> Distributed	10,000 Purchased and Distributed	10,000 Purchased 7,255 Distributed	0	2,745 Distributed
		Radio Guides for S1-4 (2008)	S1: 10,000	30,000 <sup>8</sup>	S2: 10,000	30,000 <sup>9</sup>	S3: 8,000	8,000			S4: 5,000	3,000 <sup>10</sup>
		CPD CDs									6000	6000
		ODL Resource Books									12000	12000 (ODL Yr 1 6000, ODL Yr 2 6000),
		Music CDs							0	68		
		S4 Supplementary Readers									0	600,000
		PEA & P2P Manuals	0	20	0	3,000	0	6,000	0	6,600	0	600

<sup>6</sup> The 450 were taken out of what remained after distributing 9,052 radios, 498 remained. Some radios were being withheld for cannibalizing purposes.

<sup>7</sup> 3,000 radios were purchased and 600 were donated by the manufacturer. FreePlay Foundation plus the remaining 498 were used to distribute the 4,098 radios.

<sup>8</sup> 10,000 Radio Guide copies (RG) were produced for Term 1, & another set of 10,000 RG copies for Term2 & finally 10,000 RG copies for whole S1 programs were printed and distributed to S1 teachers bringing the total to 30,000 copies. The break-up printing was due to pace of tight of production schedules.

<sup>9</sup> 10,000 Radio Guide copies (RG) were produced for Term 1, & another set of 10,000 RG copies for Term2 & finally 10,000 RG copies for whole S1 programs were printed and distributed to S2 teachers bringing the total to 30,000 copies. The break-up printing was due to pace of tight of production schedules.

<sup>10</sup> The initial procurement for Standard 4 Radio Guides had to be canceled due to vendor's inability to provide printed guides. A second procurement was initiated with the CPD guide printing vendor. This procurement proved difficult for them to complete in time and we were obliged to bring delivery to a halt at the end of the project.

Indicator	Means of verification	Baseline Year	2008		2009		2010		2011		2012	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
		TTC Manuals									0	300
		CBE Guides									0	1,000
		SABER MP3 Players									0	12
9. Programs that inform policy in teacher training and radio-based learning	Reports on activities	2010	In progress (various project interventions have been done to inform policy). Refer to the narrative after the table.									
10. Number of guidelines submitted proposing change to ministry structures in order to continue production and broadcast of programs to improve equitable access to quality education.	Sustainability and staffing plan submitted to MoEST	2010	0	Options for Broadcast and Educational Media Instructional Environment <sup>11</sup>			0	Alternative Broadcast Modalities for Educational Programming <sup>12</sup>	2	1	1	Both discussed on 14 <sup>th</sup> June, 2012 with USAID and MoEST for final submission to USAID.
11. Number of MCDE personnel trained to conduct monitoring and evaluation of activities	Training Reports	2008	12	12 F=6 M=6	12	12 F=6 M=6	12	12 F=6 M=6	12	11 <sup>13</sup> F=6 M=5	12	11 F=6 M=5
12. Number of MoEST personnel trained in media and production	Training Reports	2010							2	0	2	0 (MoEST/MCDE yet to deploy staff to studio for media and production)

<sup>11</sup> EDC commissioned a research before it began broadcasting its programs to establish viable options for broadcasting IRI programs it was going to produce. MBC was chosen after the research.

<sup>12</sup> EDC commissioned another research to look into alternative modalities for broadcasting educational programs in 2010. The report with recommendations was submitted to MoEST for consideration.

<sup>13</sup> One MCDE tutor got transferred to the Divisional office hence the reduction in the number of tutors from 12 to 11.

### *Indicator 9 Narrative:*

Programs that inform policy on teacher training and radio-based learning

This indicator is a narrative that periodically describes how output indicators in the areas of CPD, IPTE and ODL using radio-based learning contribute to larger long-term outcomes such as capacity building and systems strengthening, and influence policy decisions. In particular, it would be a desirable outcome for MoEST to institutionalize the use of IRI and mainstream IRI management and support into all its regular activities.

This was a qualitative (narrative indicator) that was registered all Tikwere! activities that positively contributed to policy making or policy decisions within MoEST. The following are such activities that Tikwere! registered:

a. Paying for Tikwere! (IRI) radio programs

EDC, an American NGO that introduced IRI in Malawi lobbied MoEST to accept costs for airing Tikwere! Radio programs to MBC. MCDE an institution within MoEST responsible for open and distance learning where EDC was housed took over the cost for airing Tikwere! radio programs. This will ensure, even after EDC has phased out, that learners in primary schools will still enjoy Tikwere! radio programs.

b. Mainstreaming of Tikwere! radio programs into the day-to-day time table of school life

In July, 2012 MoEST circulated a memo signed by the Principal Secretary of Education to all schools in Malawi informing and asking them to accept Tikwere! radio program by adhering to the times Tikwere! radio programs are broadcast on MBC. This removes the fear that teachers had that Tikwere! was extra curricula activity that disturbed the flow of the school timetable. With this memo, all

teachers, head teachers and their supervisors who are PEAs will embrace Tikwere! radio programs and ensure that learners in their respective schools always listen to Tikwere! radio programs.

c. Decentralized Radio Management System

To ensure that learners have access to Tikwere! radio programs, Tikwere! trained 32 radio repairers from 32 of the 34 educational districts in the country. The district-based radio repairmen were requested to train zonal radio repairmen as one way of transferring skills to ensure sustainability. It was reported during the August 2012 of District Education Managers and Educational Divisional Managers that some districts had already embarked on zonal radio repairmen training. Other educational districts reported of including purchase of radio for Tikwere! radio lessons in their 2012-2013 budgets to enable them purchase the brands of radios that have stronger reception for MBC like Rising than the original Tikwere! Radios supplied by the project.

d. Introduction of Tikwere! (IRI) in TTCs

Having realized that in-service teachers were being introduced to IRI while teacher trainees with their lecturers in TTCs were not, Tikwere! in its Phase 2 introduced IRI to TTC to fill this gap. TTC lecturers were oriented to IRI (Tikwere!) and then later tasked to develop lessons which they would use to introduce IRI at TTC level so that graduating teacher trainees are able to handle Tikwere! radio programs when they graduate from TTCs. A total of 17 lessons which embedded IRI were developed by a select of TTC lecturers (5 in English, 3 in Mathematics, 3 in Chichewa, 3 in Life Skills and 3 in Foundation Studies). These programs were pilot-tested in 4 TTCs for the whole 2010-2011 school year before being rolled to all 11 TTC in the country. At the end of the 2011-2012 school year, Tikwere! organized a review meeting where the programs were refined further to better support the introduction and implementation of IRI at TTC level. MCDE will lead the final steps to ensure that before beginning of the 2012-2013 school year, revised TTC IRI programs are in place.

e. CPD – audio and video opportunities

Tikwere! developed and pilot-tested CPD audio and videos to ensure continued support to professional development of teachers. All the zones in the country were provided with CPD audio lessons to use during some of their CPD sessions. A total of 6 randomly selected zones (TDCs) within Blantyre involved in the pilot study for CPD videos and the findings are discussed in the technology section below.

f. Staffing and Sustainability Plans implementation

To ensure continued production, airing and revision of Tikwere! radio programs, EDC and MCDE consultatively developed staffing and sustainability plans which were discussed and refined by MoEST and USAID, the donor. The staffing plan ensures that MCDE has enough staff to continue producing, airing and revising Tikwere! lessons while sustainability plans looks at ensuring that Tikwere! radio programs do not die with the phasing out of EDC in September, 2012. Both documents; staffing plan and sustainability plan are at final stages of endorsement.

## Introduction

This Tikwere Final Report is based on the project life from May 2007 to September 2012 which was completed in two phases; one from May 2007 to February 2010 and the second from March 2010 to September 2012. This report covers the entire period of Tikwere! from its birth in 2007 to the culmination in 2012. The deliverables included:

- Procure 23,000 radios (600 were donated from Free Play) distributed to 5,307 public schools,
- Install recording suites in 2007 and then 2010
- Produce and broadcast S1-3 IRI lessons to 2,133,729 learners
- Establish a renewable broadcasting agreement with Malawi Broadcasting Corporation
- Produce and distribute 84,000 radio guides (S1 – 30,000, S2 – 30,000 and S3 – 8,000, S4 3000, ODL Guides – 12,000), sensitization of 24,819 teachers, 5153 head teachers and 505 other Ministry personnel by 2010
- Train all PEAs (461) on effective use of Tikwere in the classroom twice a year
- Conduct a national baseline and post survey to determine IRI effectiveness
- Integrate MCDE tutors in all training activities and all field visits (pre and post survey assessment and monitoring and evaluation of IRI)
- Improve S1, Two Three and Four programs (revise S1-3, produce S4, conduct IRI Assessment, support classroom and pupil early grade literacy and numeracy improvement, publish results to a wider audience, promote continuous assessment, and research support technology)

- Enhance teacher performance (Continuous Professional Development, TTC pre-service, improved in-service, and Open and Distance learning for teacher trainees)
- Strengthened systems for sustainable IRI delivery MCDE rationalization and draft a capacity development plan, broadcast modalities, and provide additional radios
- Complementary use of Radio and other technologies Complementary Basic Education and alternate uses of IRI.

In 2007 Tikwere! invested time in creating a solid infrastructure for IRI. We assembled a top staff of writers, producers, evaluators, outreach and finance. We installed a state of the art studio replacing old recording equipment we found at MCDE. We did this during production so that six months after starting up the project we were on air with S1 programs. S2 and S3 programs followed on time to be aired in 2009. In 2010 the school calendar was changed from January to September and though this cut 6 months out of our production calendar, we were once again on air with programs. Later we expanded our scope of work to include working with the MoEST to revised the radio programs against the revised Teacher and Learner books for S1-3, producing new programs for S4, teacher programs for Continuous Professional Development (CPD,) pre-service teacher instruction through Open and Distance Learning (ODL,) and creating integrated lessons for TTC tutors to prepare teacher trainees to use IRI in the classroom. We would also create Continuous Basic Education programs (CBE) to complement the CBE materials already created by GIZ. In all of this, it was clear that cooperation with USAID, MCDE, MIE, DEMs, PEAs, EDMs, teachers and the MoEST HQs was important in making the past five years a success. Partners such PSSP, MTPDS, GTZ and Read/ Malawi provided the inputs that were used in many ways for the successful implementation of Tikwere!

## I. Introducing IRI

When Tikwere began, PCAR (Primary Curriculum and Assessment Reform) was completing its inaugural year in classrooms. The education development community, working with MoEST and MIE had just completed texts for S1 and S3 and there was a recurrent question as to how radio could be introduced in schools without supplanting all the hard work that gone into producing PCAR. No matter how many times it was repeated it wasn't until IRI was first broadcast, that all understood that Tikwere! could in fact, support instruction without interfering with it.

IRI, a low cost, reliable and tested path for educating large number, eliminating disparities between genders and erasing between rural-urban populations was being introduced after a generation had been brought up on radio. IRI, though, improves on radio instruction that is uni-directional: IRI's interactive approach requires involvement from both listeners and facilitators. Student listeners benefit from formatively evaluated lessons that use engaging characters, recognizable settings and music and song to deliver content. Facilitators and

teachers benefit by engaging in new types of lessons and gaining the body knowledge needed to replicate methods outside of his/her teaching routines.

Historically, IRI requires a year of curriculum study, planning writing, producing and testing. After conducting our initial scriptwriter training we were on air with our first program in January, the beginning of the school year before the school calendar was changed in 2009.

## II. Developing Primary Programs

From the onset in 2007 after recruiting the first lot of script writers, training ensued for three groups of script writers (2007, 2010 and 2011). Later, when producing S4 programs, Tikwere! conducted a drama training in 2011 and again in 2012. In recognition of the increased importance life skills plays in the later grades, we invited an HIV/AIDS specialist to train Tikwere and MCDE staff in 2011. As a matter of fact, in all trainings we encouraged MCDE personnel to attend all sessions and work alongside our staff. In total, 18 script writers and 5 producers were trained in script writing and drama. This is a significant number. Eighteen professional scriptwriters have been trained and have sufficient knowledge to transfer their skills to MCDE or other personnel in Malawi. The writer and producers, though experienced professionals at the time of hire, are now experience with IRI production techniques – a very specific and technical skill. Since 2008, the two MCDE scriptwriters who develop programs, though willing became unavailable. This meant MCDE personnel were no longer involved in scriptwriting nor were they in the studio to learn and master how to record and edit programs.

Having noted this problem, in August 2011, the Tikwere's Education Advisor held a special session with MCDE tutors to demonstrate the process of translating the NPC into IRI programs. The introductory training was conducted after tutors expressed interest in learning about the process. The Education Advisor offered to follow up upon request.

In its first year, Tikwere produced 150 S1 programs as well as ten Early Education Teacher Training programs. All aspects of the production arc were respected, including a rigorous

evaluation system that tests all programs before a sample population. We completed radio guides by September 2008 so that S1 teachers could easily follow the programs in their classrooms.

Through the new programs, we sought to clarify for teachers the new methodologies found in the Primary Curriculum and Assessment Reform (PCAR.) To this end we produced, ten specialized Teacher Training programs. These programs were aired immediately prior to the early grade programs in S1, S2 and S3. Though the Teacher Training programs had a small listenership, the qualitative feedback was that they were helpful to prepare for classes and clearly explained new concepts that PCAR had introduced.

Creating IRI required an in-depth study of the syllabus, the curriculum as well as regular discussions with the authors. Tikwere held a standing meeting with the MIE technical teams to talk about the intentions behind success criteria. Tikwere technical experts exchanged openly with MIE around findings on the advanced vocabulary, the number of vocabulary words introduced at early stages and the sequence of math lessons. The PCAR posters, a pilot resource for teaching and learning, we found were difficult to see and sometimes ambiguous. The final product, we learned, was not an adequate depiction of the initial poster concept. Later reviews of the same syllabi and support materials found the same. However it was through these initial conversations, we believe, that certain inconsistencies began to be recognized.

### ***Revising Programs***

By 2010 the Primary Curriculum and Assessment Reform (PCAR) was becoming to be known as the New Primary Curriculum or NPC. The curriculum had been in use for 3 years and MIE with the MoEST had begun to receive enough feedback to warrant a review. With Tikwere! supporting implementation, any changes to this curriculum would mean changes to Tikwere! The Ministry of Education through Malawi Institute of Education (MIE) and our USAID-funded education partner, Malawi Teacher Professional Development Support (MTPDS) conducted a survey in 2011 and the findings of the survey led to a decision to review the curriculum and teaching and learning materials for S1 to S3. In April 2011, the

findings were publicized and among them, the team found that there was too much content in S1 and it was too advanced for the typical six year old. The posters, they found, were not well laid out well, though the concepts behind them were appropriate. Finally, as we all knew, PCAR had not addressed the lack of resources in Malawi's primary classrooms.

While the survey focused on the whole curricula, Tikwere! carried out its own survey which centered on IRI lessons. We sample teachers and learners from 42% of the educational districts. This was an opportune time to gather information on possible changes to Tikwere! if we were to revise earlier programs. This would result in IRI lessons that are an effective NPC support, taking into account learners' as well as teachers' needs.

The selection of schools for the survey was purposive: Tikwere! targeted schools that were reported to be listening to IRI lessons every day. The assumption was that teachers and learners who listen to IRI lessons everyday would be better placed to provide information that would lead to revising the IRI lessons based on the needs of teachers and learners. Tikwere developed a learner tool and a teacher tool to conduct the phone interviews. Afterward the data collection shared the results with production for IRI lesson revisions. This information was coupled with that received from MIE to strengthen final Tikwere programs going forward.

Below is a summary of findings:

➤ Learners

- Enjoyed the songs,
- like stories told by the "Agogo" character,
- admired the children characters

➤ Teachers

- stated that games enriched the delivery of the content and made the lessons livelier
- noted that request during the program for specific Teaching and Learning materials were not always used during the lesson

Though the S1, S2 and S3 curriculums were due for revision, the initial timeline was revised several times. Revised Standard 1 materials were received in the office well after the proposed deadline, but thankfully in time for Tikwere to make changes. In S1, Introduction to School Life – the collapsed pre-kindergarten curriculum, was collapsed even further to the first six weeks. This also meant that the remaining S1 learning areas have been expanded from the 7<sup>th</sup> week of Term One. In addition, the approach used in teaching Chichewa literacy has also changed from whole word approach to syllabic approach. S2 revisions, however, were only received in 2012, well after we alerted the ministry that we could put production teams to work on edits. Nonetheless, knowing that teachers would need programs that reflected the NPC, Tikwere! completed S2 scripts with the hopes that MCDE will be in the position to record them at a later date. In the end, S1 programs were revised and are being aired presently while S2, which did not come until much later, could not be changed in time. S3 revisions were never completed and so, we were unable to address the revisions in the curriculum. This is unfortunate as the programs will need to live alongside NPC materials. It is our hope that MCDE will dedicate time and personnel to completing S2 and revising S3 programs in the near future.

#### ***Standard 4***

S4 programs were developed in a departure from our early grades programs. Recognizing that mid-primary learners learn and interact differently from early grade learners, we developed a more sophisticated program based out of a story that would appeal to older learners. Still keeping with interactive radio and the power behind involving teachers and learners, programs still included music and pauses for participation, but now, the characters were older and the concept behind the story taps into more mature interactions with adults and with the world around them. The programs continued to follow the NPC but the questions began to revolve around problem solving and critical thinking skills. Development of the S4 programs was done in conjunction with middle school educators who were able to identify developmental differences that would impact instruction for a typical S4 learner.

Developing scriptwriters became an equally important part of developing S4 programs. True, our scriptwriters were trained and experienced in writing programs. However, we

wanted to develop their ability to create drama through stories while maintaining the primacy of education objectives in IRI. Our drama consultant, a veteran teacher and performer created a drama workshop to refine the S4 design document, character and weekly stories and help producers with techniques for coaching actors.

Tikwere! introduced S4 programs in the 2011 – 2012 school year. Tikwere! produced 150 programs. Due to electrical blackouts and an employee strike that coincided with a second currency devaluation, 147 programs were broadcast.

In the S4 programs, Tikwere! attempted to create a learning environment which challenged the learner to be at the center of the learning process. The programs promoted questioning, allowing learners to tap into their natural curiosity. The IRI lessons offered drama-based learning that promoted discovery amongst between the characters and learners. A supplementary reading book was produced to assist teachers and learners to introduce opportunities to practice reading and develop their English in preparation for Standard 5 when English becomes the language of instruction. Six hundred thousand copies of the book were printed and over 500,000 copies distributed so that every learner would have a copy. The remaining books are stored at MCDE's warehouse in preparation for replacements in the coming years. The books was developed in three parts and meant to be used over the course of the year. In addition to producing S4 programs, we conducted pre and post survey Tikwere assessment concurrently with S2 learners. We monitored programs, trained 461 PEAs and led a P2P (peer to peer training) of teachers. Radio guides were developed and distributed.

### ***Complementary Basic Education (CBE)***

Complementary Basic Education serves out of school learners through two levels of accelerated program – Level One, a collapsed S1 and S2 and Level Two; a collapsed form of S3 and S4. Tikwere! produced 120 audio programs under this component and planned to pilot the use of SABERs, a sturdy wind up MP3 player designed to withstand harsh conditions. More will be said on the pilot in the corresponding section. Based on the curriculum developed by GIZ with the MoEST, Tikwere! Mirrored the characters found in the learners books and followed the scope and sequence already in place.

Work on CBE was stalled due to a delayed national roll-out of CBE centers. The roll out, to have been conducted in stages, would have allowed Tikwere! to pilot level I programs. Six districts: Nsanje, Chikhwawa, Mwanza, Salima, Ntchisi and Kasungu were identified by the MoEST and are due to begin operation in 2012-2013, after Tikwere had closed its doors. During the project, though Tikwere! planned to commence CBE programs in one of the Southern Region districts of Nsanje, Chikhwawa or Mwanza. Tikwere hired a CBE coordinator (a former Divisional Outreach Coordinator) to oversee the implementation of the audio programs. Local facilitators have been trained and all programs have been formatively evaluation through the generous participation of Samaritan's Trust. The programs are currently with MCDE and ready to be implemented using the SABERs left in MCDEs custody. Notwithstanding the delays in implementing CBE, Tikwere! carried out a number of activities to support both Level I and II.

In an effort to fully understand how CBE, Tikwere staff attended a facilitator's meeting in November 2011 and visited three CBE centres. Lessons from the training were incorporated into the design document and programs. Furthermore, the drama consultant worked with scriptwriting teams to develop CBE characters and two of the ten scriptwriters trained became responsible for developing CBE programs. With their expertise they have produced 120 CBE programs; thirty (30) facilitators programs and ninety (90) learner programs.

Tikwere! targeted 900 learners to benefit from the 120 programs that it developed for the CBE initiative but due to GOM delays Tikwere's CBE were not implemented during life of the project.

To ensure that the programs developed by Tikwere! would be used in CBE Centres, Tikwere! trained 60 facilitators in IAI in four (4) in Chikhwawa Districts: Mbewe, Ngabu, Chikonde and Changoima, equipping them with skills to deliver lessons.

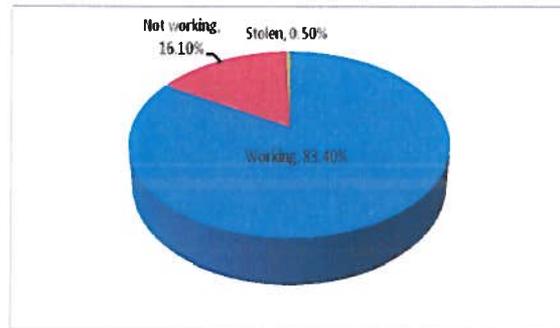
Realizing that the Tikwere! lessons would be loaded on SABER MP3 Players, Tikwere! trained five (5) PEAs from Chikhwawa and an MCDE Students Services officer on how to operate SABER MP 3 Players.

With the two levels of training, Tikwere! prepared all the personnel needed to implement the

CBE initiative in Chikhwawa and we are optimistic that MCDE will oversee its implementation.

### *Recording*

When we arrived at MCDE, the studio equipment though in fair shape, did not meet the needs of 21<sup>st</sup> century recording. In four days, we installed state of the art equipment and customized desks. A consultant from Radio Systems International (RSI), performed the installation and conducted a nationwide survey of broadcasting to potential. He scrutinized MBC's broadcasting system and met with MACRA, the government advisory body that disseminates broadcasting licenses. The final recommendations were to use MBC's Radio 2 for the best uninterrupted coverage at the lowest rates and with the highest degree of technical competence. In the end we negotiated a three-year contract for \$117/30 minute segment at an inflation rate of 5% per year. We continued to broadcast through MBC for the duration of the project. However in 2010 at the beginning of the second phase of the project, we summoned a second review to investigate the potential to find broadcasting alternatives to MBC. The second half of the project emphasized working toward a sustainable future for Tikwere: One where MCDE and the MoEST would continue to produce and air programs for a variety of educational constituencies.



In 2010, a second radio consultant worked with MCDE tutor, Fletcher Sidira, an MCDE to find out the possible options for airing IRI programs effectively. This study differed from the first in that the goal was to identify options outside of MBC. Though MBC provides a strong signal across Malawi, the cost of broadcasting did not appear sustainable and if MCDE were to expand the number of broadcast as Tikwere had done in the extension, the costs could become prohibitive. The study culminated in a recommendation to develop and broadcast over a dedicated educational channel linked to current radio towers. A presentation around the findings was conducted and a report was shared with the MoEST and with USAID before being published.

### *Radio Distribution*

The award called for a donation of 13,000 radios to classrooms. However at project start up, with current numbers from EMIS, we realized that S1 classrooms could be served with fewer radios.

*Figure 1: Status of radios in schools as of December 2010*

We procured 6,000 radios under a reprogramming and distributed them on a basis of 80/1 for all S1 classrooms. Later in 2009, we ordered an additional 3,000 radios and received a donation of 600 additional units. We coupled this procurement with 10,000 new radios ordered for the extension in early 2010 and delivered most (7,255) holding back radios for repairs, replacements and deliveries for future standards. Tikwere! conducted a school radio census between September and December 2010 and of the thirty four (34) education districts, twenty five (25) reported. At the time, 83.4% of the radios were working and .5% or thirty-nine (39) were reported stolen. In its second phase, March 2010 to September 2012, Tikwere! purchased 10,034 radios which were distributed to different schools across the country. Schools that reported shortfalls based on the radio to learner ratio received additional radios in April 2012. A total of 23,255 radios have been distributed to the 5,481 primary schools in the country since the inception of the project in 2007. In the 2011/12 school-year, Tikwere! reached a total of 2,724,633 learners in standards 1 to 4. The last of the radios were delivered at the end of the project, still keeping a few with MCDE to replace and repair old radios. Head teachers were encouraged to write reports endorsed by PEAs and stamped by the Police as evidence of the stolen property, thus eliminating the need to pay for a police report.

### ***Centralized Radio Repair***

Developing and broadcasting programs would not be meaningful if radios were not functioning. By 2010 radios were beginning to present issues, mostly misuse and poor maintenance exacerbated by repairs by untrained technicians. Though training accompanied the nationwide deliver, users began to have problems. Tikwere! devised a system for moving faulty radios from schools for repair. For schools that are far from MCDE, it naturally takes longer for radios to move from schools to MCDE and back to schools. Between August 2010 and August 2012 a total of 1,715 radios were brought to MCDE for repair. An additional 810 were repaired during the training of district-based radio repairers. The initial method for repair was lengthy. Once a school radio fell into disrepair it was delivered to the local PEA who either travelled with the radio or delivered it to Tikwere personnel in the area. To combat this process, Tikwere developed a decentralized radio repair system. In February 2012, Tikwere! organized a district radio repairers training. District Educational Managers (DEMs)

were requested to send 1 radio repairer from their districts. The radio repairers were selected on the basis of whether they could comprehend English and attended secondary school. This ensured uniformity among radio repairers and a baseline ability grasp radio terminologies during the training. Thirty-one out of 34 educational districts sent one radio repairer. The thirty-one technicians were trained by the master trainers who were trained by a Tikwere! Radio Technician in December 2011. The hands-on training netted a total of 810 radios repaired during the training. The district repairers were expected to train Zonal Radio Repairers in turn. The zonal training was to be financed and managed by DEMs. The zonal training was awaiting spare parts. The system was created by first identifying divisional repair persons who had MSCE level of education. DEMs submitted names of individuals which were vetted through our Outreach Advisor. A baseline of MSCE was established to insure that they were able to read and follow instructions for repairing LifeLine radios. Technicians left becoming members of a pre-approved list of Lifeline repair persons. With an agreed upon rate and the network of repair persons, districts are now able to address radio failures through a decentralized system. To further promote sustainability, MCDE assigned a technician to work with EDC on radio repairs. This person apprenticed with our Radio Technician and is now able to complete repairs or conduct further trainings post project.

### ***Broadcasting and Radio Guides***

Since inception of IRI programs in Malawi in 2008 to our closing in 2012, Tikwere produce 150 programs for Standard 1-4 for broadcasting. The Malawi Broadcasting Corporation (MBC) continues to experience occasional challenges in airing Tikwere! (See Figure 1). The problems may differ from one instance to another; broadcasting the wrong program, electrical outages, pre-emption for political announcements, etc. but the maintaining momentum is a delicate balance.

In the 2008 – 2009 academic year, 150 classroom programs were produced and 150 programs were broadcast, plus 10 teacher training programs to orient infancy level teachers to concepts in PCAR and the programs. Each year we continued to produce 150 programs per standard until the 2010/11 academic year. With the extension in 2010, programs

continued on the trajectory with S4 programs produced and broadcast during the 2011/12 school year.

### *Creating and Sustaining an Outreach Program*

Tikwere's initial scope of work called for Tikwere to subcontract Outreach to a local contractor. When this became clear that it was untenable, we redesigned outreach with the same goals in mind. Together with USAID and MoEST, we developed an outreach system that would work tangentially with MoEST without creating a separate, parallel system. We recruited and trained 6 Divisional Outreach Coordinators, all former MoEST professionals familiar with schools and the new curriculum. These Divisional Outreach Coordinators, or DOCs, worked with the MoEST, encouraging the Primary Education Advisors (PEAs) and their assistants to monitor and support teachers to use Tikwere. DOCs were there to troubleshoot specific problems, monitor Tikwere listenership and collect data. These coordinators were led by Dezidarius Trigu, the Tikwere Outreach Advisor seconded to EDC from the MoEST.

### *Conducting IRI Assessment*

Tikwere! has been assessing S1 to S4 learners since 2008 and the table below shows distribution of assessment surveys (Pre-test and Post-test) during the life of project. The aim of learner assessment was to establish whether Tikwere listeners were making learning gains compared to non-listeners. Administered at the beginning of the academic year and at the end of academic year, the assessment looked at mastery of content for the specific standard of learner. Test administrators were trained to develop test items by looking at NPC materials; training materials, learners' books, teachers' books, syllabi, etc. Test administrators included Tikwere staff, MCDE Staff, MANEB, MoEST Divisional Staff, PEAs and Tikwere teachers.

A total of 20 learners (10 boys and 10 girls) were randomly selected at each of the sample schools. Except for the 2008 school year, Tikwere! randomly selected 60 schools (10 per educational division) nationwide for each class. In 2009, for example, Tikwere! randomly selected 60 schools where 1,200 S1 learners were assessed and another set of 60 where

1,200 S2 learners were also assessed. In 2008, three schools were randomly selected per educational division making a total of 18. This number increased to 10 schools per educational division making a total of 60.

School year	Learners Assessed	Programs on Air
2008 (Jan – Dec)	S1	Introduced S1 Jan 2008 (beginning of school year)
2009 (Jan – Sep)	S1 & S2	Introduced S2 IRI Year Two for S1 IRI
Oct 2009 – Jul 2010	None	Phase 1 of Tikwere! ended in Feb 2010. Project end date did not allow for an assessment of learners Year Three for S1 IRI (MCDE begins to fund broadcasting for S1) Year Two for S2 IRI
Oct 2010 – Jul 2011	S1 & S3	Introduced S3 IRI Year Four for S1 IRI Year Three for S2 IRI
Oct 2011 – Jul 2012	S2 & S4	Introduced S4 IRI Year Five for S1 IRI Year Four for S2 IRI (MCDE broadcasts S1 & S2) Year Three for S3 IRI

*Table 1: Distribution of Assessment Surveys (Pre- & Post-Test) during the life of Tikwere! project*

For each assessment survey (i.e. pre-test or post-test), a total of 36 test administrators were trained on how to administer the one-on-one assessment. Twelve teams of three test administrators from a combination of Tikwere, MCDE, MoEST and MANEB staff. Each team assessed twenty learners per school per day. For these assessments to continue MoEST can pool personnel between MCDE and select Tikwere teachers. This approach of using teachers in P2P, assessment and as focal teachers (Mr./Ms. Tikwere) seeks to identify the highest performing professionals and empower them to participate more fully in the cycle of

training-teaching-assessment that is Tikwere! Regular assessment and analysis of that assessment will determine the continued impact on Malawian learners from S1 to S4.

To compare results for Chichewa, English and mathematics we used mean scores on both the pre-test and post-test for each subject in order to verify whether the results reflected above average scores. Thereafter, the learning gains were determined using the Percent Interval methodology which looks at the difference in mean scores between pre-test and post-test for treatment and control schools. (See Table 2) A 10.0% target was established for learners in treatment schools to score higher than their colleagues in control schools.

2008 Analysis of Learning Gains							
Subject	Treatment		Control		PI (Treatment)	PI (Control)	PI (Treatment v Control)
	Pre	Post	Pre	Post			
2008 S1-Chewa	10.9	23.2	13	17.5	12.3	4.5	7.8
2008 S1-Maths	20.8	59	24.6	51.9	38.2	27.3	10.9
2008 S1-English	17.1	63.1	20.6	51.7	46	31.1	14.9

Table 2. Calculation of Learning Gains using Percent Increase method

### Standard One

Overall the results show that learners in treatment schools continue to perform better than their classmates in the control group. In 2008, learners in treatment schools performed higher than their colleagues in control schools by 7.8% in Chichewa. Though learning gains narrowed in the 2010/11

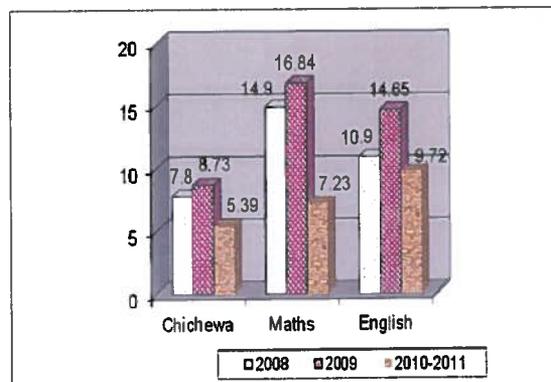


Figure 2: Learning gains for S1 learners for 2008, 2009 and 2010-2011 school years

school year when compared to the previous years, learners in treatment schools outperformed their fellow S1 learners in control schools by 5.39% in Chichewa, 7.23% in mathematics and 9.72% in English.

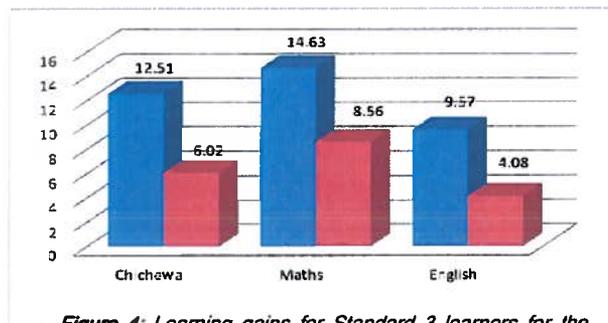
### Standard Two

In 2009 and 2010/11 school years, Standard Two learners were assessed and the results also showed that learners in treatment schools made higher gains than their colleagues in control schools.

*Figure 3: Learning gains for S2 learners for the 2009 and 2010-2011 school years*

### Standard Three

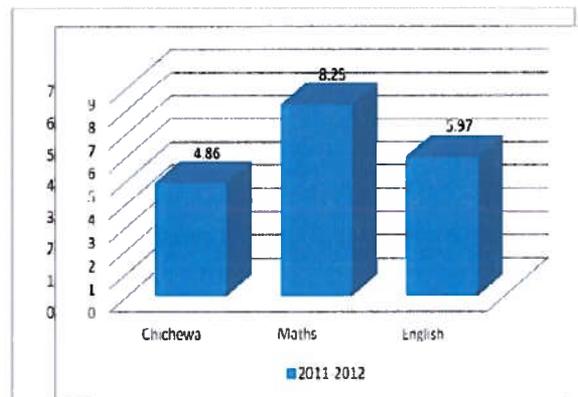
In the 2010-2011 school year, Standard Three learners also proved that Tikwere! IRI lessons added more value to the classroom learning as learners in treatment schools outperformed their colleagues in control schools.



*Figure 4: Learning gains for Standard 3 learners for the 2010-2011 school year*

### Standard 4

Tikwere! radio programs were introduced to Standard Four learners in the 2011/12 school year. Assessments show that learners in treatment schools performed better than their colleagues in control schools.

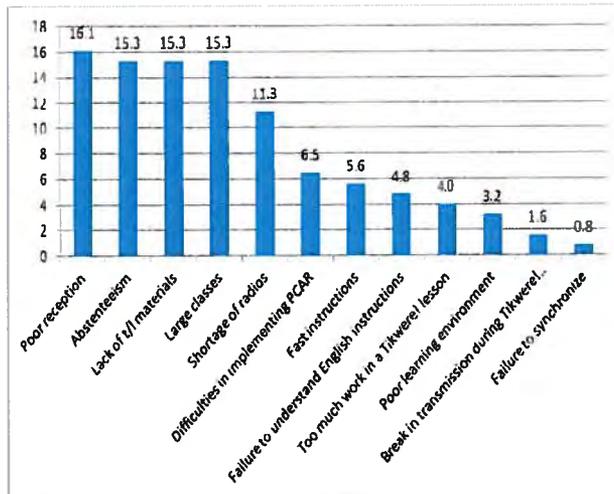


*Figure 5: Learning gains for Standard Four learners for the 2010,2011 school year*

**Discussion of the results**

Though the learning gains diminished with the years, in a 2011/12 survey, Tikwere! interviewed 128 S1, S2, S3 and S4 teachers using the radio programs. Reasons as diverse as poor reception, aging radios, learner absenteeism, large class sizes, insufficient Learner Books (NPC) and lack of S4 radio guides (printed after broadcast year,) were given as suppositions for decreased learning gains. (see Figure 6) For Tikwere! These random responses reflect the importance of regular monitoring. Poor reception and aging radios can interfere with listening, but a PEA or Head Teacher may be able to help teachers to position the class or radio to better capture the stations. Clearly if learners are not present they cannot benefit from Tikwere! lessons, but this assumes that Tikwere learner are absent more often that non-Tikwere! learners.

Insufficient Learner's Books have little bearing on the lessons as Tikwere! programs rarely refer listeners to pages in the book. However having radio guides and reasonable class sizes can factor into whether teachers are able to properly prepare for and teach the lesson, but large class sizes have been a fact in Malawi since 2008 and before and a few terms during our first two years broadcasting were done before the radio guides were distributed. Each one of these



*Figure 7: Reasons given by teachers as reasons contributing to hindering performance of learners leading to diminishing*

reasons leads us to believe that monitoring teachers' use of the programs is a worthy commitment of manpower. Directing teachers on how to properly use the radios, monitoring their use, learner and teacher absenteeism, how to double shift classes and delivering new or repaired radios may impact learning gains in the years forward.

Even with diminished learning gains, the results show that learners who have access to Tikwere! radio programs perform better than those who do not. We believe that this means

that Tikwere! truly supported the implementation of the New Primary Curriculum by supplementing the regular lessons with radio-based lessons. Anecdotal results show that the learners are excited to listen to Tikwere! radio programs and that they have helped to increase enrolment and retain high attendance in schools. In the future, MCDE may consider carrying out a study to scientifically back these claims.

MCDE and EDC conducted a one-week monitoring exercise in twenty-four (24) randomly selected schools in all six (6) education divisions across the country in March, 2011. The aim of the trip was to observe lessons, interview teachers and learners to inform the project of what was working and what needed to be improved.

The lesson observation and monitoring tools were used to collect data and the findings were as follows:

- All twenty-four (24) schools that were visited listened to Tikwere! IRI lessons despite some, such as Ntcheu reporting poor reception. However, on the day of the visit, St. Peter's and Katoto primary schools did not listen to Tikwere! IRI lessons because it was reported that most teachers were attending a meeting elsewhere
- Learners followed the radio teacher's instructions in Chichewa, Mathematics and Life Skills but struggled with English. Learners struggled due to poor or no English skills. Teachers attributed the low English skills to the new curriculum which they indicated as having difficult words
- Teachers' schemes of work were synchronized with Tikwere! IRI lessons. This meant that what teachers taught in their regular lessons matched the radio lessons
- Teachers felt that PEAs need to regularly supervise, support and advise them

When teams conducted the post-test of S1 and S3 learners, they also observed IRI lessons and gave feedback to teachers on how to best to teach Tikwere! IRI lessons. The findings were the same as the ones outlined above. The original plan was based on obtaining information from the partner project, MTPDS. Instead, Tikwere! is using results on pre-test and post-test to provide information for programs and guides.

### *What We Learned*

1. Programs were timely: after PCAR was introduced, teachers were confused about methods, songs and pronunciations. The radio answered these questions
2. The number of MCDE personnel continued to be inadequate during the project life. In fact it was decreasing, as personnel retired or transferred away. No new tutors were recruited nor were any existing tutors replaced with primary education tutors or any person with primary education expertise. Existing MCDE staff, though encouraged by the Acting Principal, did not take full advantage of training provided by EDC. Finally, it was also not easy to share the one graphic designer from MCDE.
3. A complete capacity transfer to MCDE looks unlikely in the immediate future. Project obligations have very hard and fast completion dates that could not be delayed by inconsistent participation on MCDE's part. There are a few MCDE staff available who participated in project activities and they should be able to lead their areas within Tikwere! such as outreach and monitoring and evaluation.
4. One of the challenges Tikwere! faced was mis-broadcasting programs. As an example, a Standard Two program was aired instead of S1.
  - a. We learned that it was ideal for the teacher to have the radio guide available to teach the lesson in case of broadcast anomalies.
  - b. Having staff listen on a basis, we were able to better manage broadcasting issues. In fact, it is important to have a number of people listening to the programs so that any mis-broadcast can be corrected in time.
  - c. MCDE will also need for a "telephone hotline" with the broadcaster and a specific person assigned to handle Tikwere matters at the broadcasting station.
5. Double Shifting: One of the major challenges in broadcasting the Standard Four programs is the introduction of double shift system. The MoEST introduced a circular limiting each class to sixty (60) learners forcing some standards to have three or

more classes to maintain the 60:1 ratio. These teachers teach two or three consecutive classes. An example might be S4A enters at 7:30am, S4-B enters at 10:30am and S4-C enters at 12:00. The last class (i.e. S4-C) is present after the first two classes knock off. This system has negatively affected listenership of Tikwere mostly in Standards Three and Four. The late class misses the IRI lesson. Tikwere responded by changing the broadcast time so that Standard Four learners who report late should still listen to the IRI lesson. We were only able to make this shift by surveying teachers, communicating with several branches of the ministry and listening to programs.

6. Operating under various timelines can cause delays in implementation. CBE was produced to pilot test the IAI materials in government sanctioned sites. Tikwere! worked with USAID to request on our behalf that the MoEST and other donors under the Project to Improve Education Quality in Malawi (PIEQiM) complete procurement of CBE site operators if Tikwere! was to complete this deliverable. The delays continued until project end and pilot testing the SABERs was under the proposed context was no longer possible.
7. Outreach is a requirement for programs to continue to be used. Tikwere! has taken the necessary steps to include a Tikwere! monitoring instrument in the regular PEA monitoring tool. The tool was developed jointly and delivered to DIAS. Infrequent supervision, though affects teacher support and consistent listening. Unfortunately, the PCAR M & E Framework had been pilot-tested in three educational divisions (SHED, SWED, SEED) with 100 PEAs without the benefit of the Tikwere!-enhanced tool.
8. Regular training for radio and audio is an important investment in time and personnel. Our innovative P2P training paired experience IRI users

Radios: Zomba Rural and Mulanje Education Districts did not send their radio repairers, so DEMs of the mentioned educational districts need to make a plan to send their chosen radio repairers to be trained by the Tikwere! Radio Technician at MCDE.

Tikwere! had difficulty obtaining spare parts from the Lifeline radio supplier. Tikwere! Kept liaising with freighters and clearing agents as well as the supplier to assure delivery of the procured and dispatched spare parts.

### *Recommendations for continued implementation of Infancy level radio programs*

- Assign recurrent **funding** for IRI: Now that programs have been created it is dependent on the ministry to commit to putting them to use. Continuing to air programs and seeking cost effective means for all schools to hear the programs will remain a challenge for central and local school administration. Tikwere's initial study of radio capacity and follow-up study on broadcast alternatives should be included as guiding documents, among others, to identify a low cost means to continued educational broadcasting
- Continue to **revise** programs to follow revised NPC: writers, producers and program developers trained in creating IRI that produce interactive programs that at their core produce excellent teach and train. (A recognized secondary effect of IRI is that teachers learn alongside learners. Teachers practice activities and teaching methodologies expressed in PCAR and recognized as good teaching practices) However these writers, producers and program developers must be able to think critically, work together and understand the unique needs of their audience whether it be early or middle grades teachers and learners. This will not only require MCDE to recruit differently, but for teacher training colleges to address these differences at the early stages of a teacher's education.
- Continued **outreach** to DEMs, PEAs and teachers for feedback on Tikwere in classrooms. While teacher feedback is important and necessary, developers will need to balance classroom needs with the necessity to shift practices. This shift will require teachers to move faster, use targeted repetition and include more instruction throughout the day.
- **Monitor** teachers as they use Tikwere. Positive results from Tikwere rely on regular listening and faithful implementation: Assuring that all children can hear programs by

properly maintaining radios, participating in the programs and encouraging learners to listen and participate as well as incorporating teaching methodologies to support PCAR's proper delivery.

- **Re-consider** the number of hours teachers have contact with learners. In light of a 2009/10 of reading instruction in schools, the number of hours available for instruction

With an assigned contact person for both Tikwere! and MBC, we were able to eliminate broadcasting anomalies. Additionally we have added a line in the radio guides to call MCDE's Outreach/Student Service Section when programs are not aired.

- From the start, we insisted that staff tune in to the programs as listening monitors. Not only were we able to address programs that were not on air, disruptions or mistakes (incomplete broadcasts or interruptions from other programming) could be addressed on the same day.
- As a solution, DIAS and Tikwere! started the process of incorporating Tikwere! in the PCAR M & E Framework. MCDE will ensure that this process is completed by October 2012.

### III. Enhanced Teacher Performance

To enhance teacher performance, the project worked hand in hand with MoEST, MIE, MTPDS and other such partners to implement the CPD, teacher training and introduction of IRI in TTCs.

#### *Continuous Professional Development (CPD)*

In the period from March 2010 to September 2012, Tikwere produced 48 CPD audio lessons based on Malawi Teacher Professional Development S (MTPDS) work in CPD. Programs covered Literacy, Numeracy and Academic Life Skills with elements of leadership embedded

in most of the programs. We attended three MTPDS sessions to exchange information on our respective approaches and a MTPDS' training of trainers for CPD. Together we developed a strategy to help teachers improve. These trainings were critical to produce CPD materials and ensured that MTPDS and Tikwere! were part of the same intervention. Tikwere! produced programs supporting the topics and content for MTPDS' CPD training. Our mandate was to work with and complement USAID work in country. The first 24 were developed in the fiscal year October 2010 and called year 1 CPD audio programs. The Year 2 programs were developed in Tikwere's last year. This was designed in a way that teachers would have eight CPD programs per term, evenly dividing programs among the three terms.

In December 2010, EA and IRIAs teleconferenced with MTPDS to discuss our mutual progress with CPD. We decided the following; both programs would focus on teaching methodologies, leadership programs and support to teaching numeracy.

By the end of the project Tikwere! duplicated the 48 CPD programs into 6000 copies which were distributed to all TDCs in the country for teachers to use during their CPD sessions.

### *CPD Videos*

In addition to CPD IAI, Tikwere! produced six CPD videos with an aim of pilot-testing how much the video would contribute to enhance the performance of teachers. The video enable enabled teachers to see while listening and thereafter critique the lessons. In February and September 2011, Tikwere! shot 6 videos in the following learning areas; Mathematics, English, Chichewa, Life Skills and Leadership. These videos were shot in different schools in the Southern part of Malawi (Blantyre, Zomba Chiradzulu and Thyolo). The schools visited, learning areas shot and date were: Mponda Primary School (Mathematics) in February 2011, the following were shot in September, 2011 Mathematics - Madziabango Primary School, English – Nanjiriri Primary School, Chichewa – Luchenza primary School, Life Skills – Chanza Primary School and Leadership – Limbe TDC.

As already indicated, just like CPD CDs (audio), the six CPD videos contain demonstration lessons that enabled teachers to engage in debates around teaching methodologies and thereafter incorporate these practices from the sample lessons into their classroom. The

CPD video were done in such a manner that enabled teachers to actually see the lesson in session, discuss and compare appropriate versus inappropriate strategies and thereafter distill the best practices. These CPD videos had questions inserted within the video and instructions to pause the video to allow teachers debate on the lesson.

The CPD Video initiative was pilot-tested in 6 educational zones within Blantyre using pico-projectors. The pico-projector is solar powered as such even zones (TDCs) without electricity were involved in this study.

Two teachers who were coordinating CPD activities in their educational zones from each of the 6 educational zones making a total of 12 were trained on how to operate the pico-projectors and also on how to use the CPD videos for CPD.

At the end of the pilot, the findings were as follows:

#### ***What We Learned***

- CPD videos promoted teaching and learning methodologies through live observation (*I see, I Remember*) from the video and teacher to teacher interaction after watching and critiquing and/ debating on the video lessons. More effective and positive contributions were poured in by the teachers as they watched observed the CPD videos.
- Teachers were able to assess themselves and noted where they were right as well as where they were wrong and learned the new techniques to correct the situation in class.
- Teachers noted that not all learning areas were covered as they wished they had seen how various learning areas could be handled.
- Battery drained quicker than expected as such needed charging more frequently
- Volume was low for the size of the class
- There was need to include content on facilitation so that mentors, Assistant Coordinators and PEAs would also improve on their facilitation skills while using the pico-projectors

### *Recommendations for the future*

- Facilitators will need programs for future reference, as a reference and to improve facilitation skills
- The battery life and volume still remain challenging. Monitoring shows that classes are easily interrupted by outside noise due to large class sizes – classes of 100 and 150 for example, and are not adequately audible for the whole class
- The Pico-projector's portability makes it useful for school use and can be used for school-based INSETs.
- If schools and/or TDCs were provided with pico-projectors it would promote uniformity as all teachers would be seeing the same videos and keeping sharing on ways of improving on the delivery of lessons using the methodologies seen on the videos.

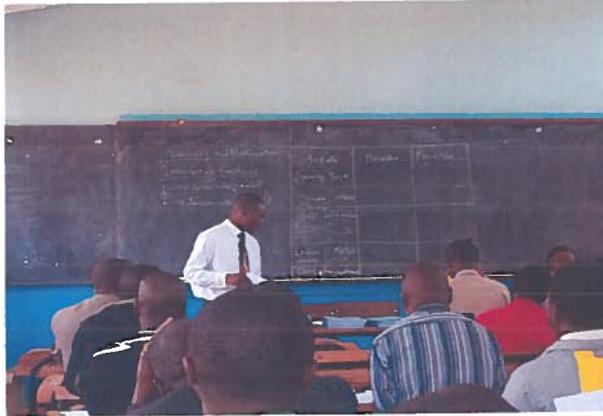
### *IRI Intervention in TTC Pre-service (The Initial Primary Teacher Education)*

The objective of introducing Tikwere! and the Interactive Radio Instruction (IRI) methodology in TTCs was for teacher trainees under the Initial Primary Teacher Education Programme (IPTE) to learn how to use Tikwere! and the IRI methodology in their classroom after graduating. IRI Lesson plans for English, Mathematics, Chichewa, Life Skills and Foundation Studies, were developed to guide tutors in teaching teacher trainees how to use Tikwere! and IRI methodology.

The IPTE is a two year teacher training programme targeting those who intend to become primary schoolteachers. The programme has a first year which is college based when teacher trainees are introduced to classroom pedagogy and internal teaching practice at a demonstration school. This is followed by a second year which is school based - teacher trainees are attached to a primary school to put to practice what they learned in college. It is during the second year that teacher trainees are expected to "experiment" handling an IRI methodology and program. Past monitoring showed that it was difficult for teacher trainees to use IRI without prior training; hence, these teacher trainees shunned away from using it in the classroom upon graduating. That is why it was decided that IRI -Tikwere methodology

and programs should be introduced in all private and public TTC in Malawi during the second phase of Tikwere!, March 2010 to September 2012.

In September, 2010, four TTC colleges (two private - Chilangoma TTC, and Maryam TTC and two public - Machinga TTC, Blantyre TTC) were selected as pilots for IRI training. This was followed by tutor training in November, 2010 in the same pilot colleges. Each of the pilot TTCs was given the following materials to be used together with the lesson plans: five CD players, recorded programs for each learning area, and



one Tikwere radio. Later three radio guides and ten guides were given to each of the two colleges (Chilangoma and Maryam), five radios and twenty radio guides to Blantyre TTC and Machinga TTC. The number of materials given was based on the number of students enrolled in each college. The materials were piloted for one academic year (2010-2011). After the pilot period, lessons were reviewed based on the findings and in August, 2011 IRI was rolled out to all the 11 TTCs in the country.

Before rolling out to all TTCs, Tikwere! carried out a year-long pilot study of the TTC IRI lessons which were developed in English, Mathematics, Chichewa, Life Skills and Foundation Studies. Tikwere!

developed monitoring instruments which were self-administered by tutors

*Figure 8: One of the tutors facilitating during TTC IRI roll out at Machinga TTC*

and teacher trainees after each IRI lesson. Tutors and teacher trainees were oriented on the monitoring instrument before they started using the IRI lessons. The orientation for the pilot was conducted for 35 participating tutors and a randomly selected sample of 260 teacher trainees in the four pilot colleges. Tutors and teacher trainees were oriented separately in a face-to-face session. The instrument was introduced and discussed item by item. Since then, two monitoring exercises were done termly in the 2011-2012 school year.

Results from the monitoring exercise showed that the IRI TTC pilot made positive progress:

- In three of the four colleges (Blantyre, Machinga, and Maryam) the tutors had difficulties including IRI programs under Foundation Studies since they were not able to understand that the IRI lessons were meant to inculcate the IRI methodology and not content. As such, the three colleges did not know how to integrate the IRI methodology into the Foundation studies. But it was different at Chilangoma DAPP TTC because they were able to understand how the IRI lesson plans and IRI methodology can be included under Education Foundations. As a result, a tutor (Mr. Mitengo) at the DAPP TTC was requested to document and share his experiences with the rest of the Foundation Studies tutor in the other three colleges. Indeed Mr. Mitengo shared his experience through a one page presentation which was e-mailed to all concerned tutors. Upon this e-mail explanation, the other colleges were able to adjust and understand the inclusion of IRI in Foundation Studies.
- As a pilot, the four TTCs provided rich data for review prior to full-roll out in the 2011-2012 academic year. Major issues for possible review were: phonology, audibility of English lyrics and advance information on materials needed for teaching and learning IRI lessons.
- Overall the lessons were relevant, informative, useful, and complete as training materials although each TTC progressed slowly. The college tutors found the radio and accompanying guides as fundamental for teacher trainees to succeed in using the IRI in the primary school.

A review meeting of the lesson plans based on monitoring findings was conducted at MCDE in July 2011 before rolling out in August 2011. The objective of the meeting was to review the lesson plans of each learning area, listen to the program segments of the lesson plans and make possible recommendations on what needs to be changed or modified. A total of 20 tutors, four per college and one in each learning area, from all the four colleges (Blantyre TTC, Chilangoma TTC, Maryam TTC and Machinga TTC) were invited to review the materials. The content of the programs, characters, language used in programs and

application of IRI methodology under Foundation Studies were reviewed and program segments were re-recorded based on the review.

The IRI lessons were in use in all eleven TTCs in the 2011-2012 school year. During monitoring, Tikwere! learned that some tutors had problems using the IRI methodology. It was established that new tutors as well as some old tutors had difficulties using the programs which meant denying the teacher-trainees an opportunity to know and master IRI. When Tikwere! dug deeper it learned that the IRI lessons needed further refining so that all tutors would use them confidently. In response to this, Tikwere! organized a workshop for selected tutors to meet and refine the lessons plans in July 2012 so that when the 2012-2013



*Figure 9: Briam Mtauchira, an ODL teacher trainee at Chinduzi in Machilanga*

school year starts, the IRI lessons should be done and ready for use in class in TTCs. The selected tutors were from each of the 12 TTCs as a new TTC was opened in the course of the 2011-2012 school year by DAPP in Dowa. As EDC closes its doors, MCDE will lead the finalization of the revised IRI lessons and take them back to TTCs by Mid September 2012.

### ***IRI support for Open and Distance Learning teacher trainees***

Parallel to the IPTE program, the MoEST has introduced an Open and Distance Learning (ODL) teacher training program for aspiring primary school teachers. The program has recruited 3800 students; 2,289 male and 1,511 female students, in 2010/2011 and 5500 students in 2011/2012 academic year. ODL teacher trainees spend most of their time in primary schools teaching and less than half of their two years at college. That is why Tikwere! assisted them in their studies as well as helping them to practice some of the topics they teach.

The overall objective of Tikwere! ODL intervention is to provide support to open and distance teacher trainees by producing IRI programs that instill knowledge and skills and added support from their lecturers/tutors using web2sms. Tikwere produced and broadcast 48 ODL programs for two years of programs: The first 24 in 2010-2011 academic year and the other 24 in 2011-2012 academic year. During 2010-2011, twenty four (24) programs were produced and aired through the MBC. The programs treated mathematics, English, foundation studies, and life skills. The programs guide teacher-trainees to teach primary topics in mathematics, such as addition, subtraction and multiplication, English grammar, life skills topics of health and hygiene and teaching methods, teaching skills and classroom management found in foundation studies. These areas reflect subjects covered in the ODL modules as well as practical aspects of teaching. The programs also help teacher-trainees prepare for assignments and examination questions. In the second year, 2011 -2012, twenty four programs were produced and aired through MBC and the programs, treated Agriculture, Social Studies and Chichewa. Tikwere! also produced and distributed 12,000 ODL booklets, 6,000 for year one and 6,000 for year two.

One of the successes of Tikwere ODL programs is that it has assisted ODL teacher trainees to execute assignments and prepare for examinations. Brian Mtauchira, an ODL teacher trainee at Chinduzi Full Primary School in Machinga District, appreciates Tikwere programs because these programs assisted him to write assignments and prepare for examinations by following the tips on how they can answer questions. In addition, the programs also helped Brian Mtauchira to teach primary school learners to read Chichewa and English and place value in mathematics. The programs have been helpful to ODL teacher trainees because they are the only source of supplemental information. They depend on ODL Tikwere programs for their studies since teacher trainees were not given materials. That is, ODL teacher trainees for year 1 were only given one module for 2011-2012 academic year and ODL teacher trainees who have just been recruited (ODL year 2) have not yet received modules to date.

### *Web2SMS Training*

Given that teacher trainees lack contact with TTCs and tutors, Tikwere developed a web2SMS training to improve communication between ODL tutors and trainees on

assignments and course work. A total of 175 tutors out of 277 from the six public TTCs (Blantyre, St Joseph, Machinga, Lilongwe, Kasungu, and Karonga) were trained to use the Web2SMS system. The number represents 63.2% of the total expected participants. The trainings were conducted in each of the TTCs. An added benefit was that Tikwere started communicating directly with ODL trainees and coordinators using this system.

The training was categorized into two; practical and theoretical. The morning session was conducted by Tikwere! staff where 102 tutors had a hands-on Web2SMS training. Another group of 73 tutors joined the 102 during an afternoon session for a P2P. This session was led by a select group of tutors while Tikwere! staff acted as facilitators.

Feedback from the Web2SMS training revealed that 96.2% understood the principles. These included; when to use bulk SMS, how to send an SMS, creating phone book and importing the phone book. All participants in the Web2SMS training indicated that they would use the acquired skill to send SMS to ODL teacher trainees as well as a fellow tutors. In addition, the results revealed the need for tutors to have a training manual and a user's manual. Following this request Tikwere produce a training manual and user's manual for the colleges. .

Notable success of the Web2SMS is that tutors are able to send messages to ODL teacher trainees. For example Kasungu TTC ODL Coordinator communicated with his trainees on examination matters towards the end of June 2012. Furthermore, the Outreach Coordinator is able to communicate with ODL Coordinators and ODL teacher trainees without a problem. For example, in mid June 2012 a group of ODL teacher trainees in Chiradzulu were informed of a pending formative evaluation date using the same system.

### ***Improved In - Service***

This section covers how Tikwere! trained teachers on how to handle IRI lessons in class as well as how it equipped PEAs and other educational officials with IRI and such related skills. A total of 6 training sessions were held for PEAs and other educational officials for the entire period of the project. Another set of training sessions were held for teachers during the life of the project. The details are discussed below.

## Teacher Training Systems

### Training conducted by Divisional Outreach Coordinators (DOCs)

There was need to train teachers on how handle Tikwere! radio lessons in classrooms. In 2008 when Tikwere! radio lessons were on air for the first, all S1 teachers were trained by Divisional Outreach Coordinators (DOCs) who were project employees. Each of the 6 educational divisions had one DOC. This system took a long time for DOCs to train teachers zone by zone in their educational divisions.

### Peer-to-Peer (P2P)

Having seen that this system was taking too long to reach all teachers, in 2009 Tikwere! devised the Peer-to-Peer (P2P) teaching training system which had three levels. The first level was composed of core-trainers who were mostly EDC and MCDE staff. The core-trainers in turn trained trainers-of-trainers (TOTs) who were PEAs. The PEAs selected good teachers who were oriented by the PEA before the training of teachers. The chosen teachers were the actual facilitators while the PEA supervised the training and supported the facilitators wherever need arose. It was called P2P because teachers were training each other. Tikwere! prepared training manuals which were used for preparations for the training but on the day of the actual training which was called as Tikwere! Day instructions were broadcast from MBC so that all teachers across the country received the same information.

### Modified P2P

In the last two teacher training sessions, the system was modified for the sake of sustainability where one PEA from each of the 13 training centres across came to train as core-trainers and managed the rest of the training. This empowered PEAs because they were equipped with skills for planning and conducting an IRI (P2P) training for teachers.

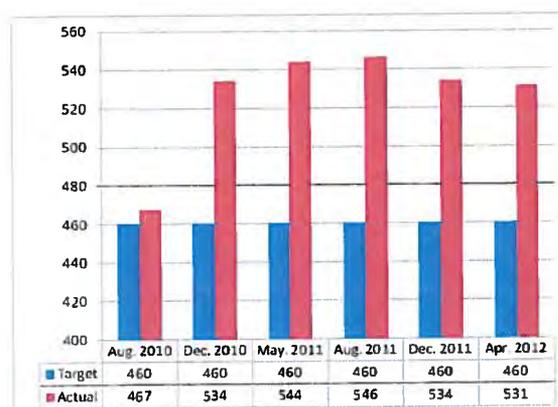


Figure 10: Targets and number MoEST officials trained in IRI and related skills

### *Training for PEAs and other Educational Officials*

Tikwere! increased the institutional capacity of education officials to use technology appropriately in the classroom, and kept a count of the number of MoEST and other education officials who participated in IRI training and supervision, planning, training, monitoring or evaluation of Tikwere! activities. PEAs were the major educational officials that were involved in these training sessions.

Figure 8 shows that the target was always exceeded in the 6 training sessions that Tikwere! organized for MOEST Officials. The target of 460 never changed throughout the project life because during target setting the indicator targeted PEAs who were 460 and there was no indication that MoEST would increase the number of establishments for the post of PEAs within the project life of Tikwere! contrary to that understanding, MoEST re-demarcated some zones and increased the number of PEAs in urban educational districts due to high enrolment numbers of learners. For instance, Blantyre Urban educational 4 zones with 2 to 3 PEAs in each zone. Such strategies led to increase in the number of PEAs and after consultations and learning some lessons, Tikwere! began involving Desk Officers for Primary Education based at District Education Managers Offices as well as divisional based Senior Educational Methods Advisor (SEMAs) who were involved in the monitoring of Tikwere! lessons in schools. MoEST education officials underwent two types of training. One type was where they were trained as trainers-of-trainers to lead P2P training sessions in their respective zones and the other type was where they were trained as supervisors. When being trained as supervisors they were equipped with knowledge and skills on monitoring and supporting teachers after observing a Tikwere! lesson using the Tikwere! Lesson Observation Tool. This type of training enabled PEAs to walk in a Tikwere! lesson and afterwards provide feedback to teachers with confidence. This kind of feedback helped teachers to keep improving on delivering Tikwere! lessons.

### *Training for in-service teachers*

In its five years of implementation, Tikwere! held 6 training sessions for teachers in IRI. The topics included introduction to IRI, handling Tikwere! lessons, use and care of Tikwere! radios, managing large classes, use of learner-centred methods (group work, pair work, role-play, and others), continuous assessment and introduction to other Tikwere programs like

CPD and ODL. (See Figure 11).

Tikwere! used an innovative approach to training called Peer to Peer or P2P. This approach aimed to recognize teacher’s involvement in the development of their peers as well as recognize teachers who mastered the use of Tikwere! in the classroom. Training sessions which are usually conducted by a “master” coming from outside the school cluster to “deliver” information becomes the

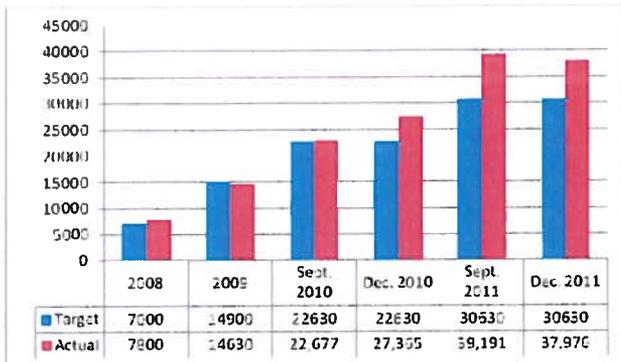


Figure 11: Targets and number of Teachers trained throughout project life of Tikwere!

informed practitioner delivering training to his/her colleagues – this, we believe is a crucial step in developing teachers: Raise awareness of the high performing teachers, holding them accountable to the standards we ask them to practice and allowing them to pass on their knowledge about how “it works” in the classroom.

The results show that Tikwere reached and exceeded its target. In 2009 however, Tikwere! fell short of the target by 2%. However, even in 2009, Tikwere listeners outperformed non-Tikwere! listeners. All training sessions were held throughout the country on what we called Tikwere! Day. Tikwere! teacher training sessions were referred to as Peer-to-Peer (P2P) because they were facilitated by fellow teachers with support of instructions aired from MBC radio station for the sake of uniformity. Another innovation we introduced in Tikwere! was this very radio based training. Given our belief that radio is a powerful tool of instruction, we used it to introduce IRI to PEAs and teachers. The radio provides a consistent message not always possible through cascade training. PEAs were trained immediately before the P2P and served as trainers-of-trainers. Five facilitators worked the PEAs on the Tikwere Day. Areas with poor reception received CDs of the sessions. To support the delivery of the training content, Tikwere! provided training manuals in much the same way that we deliver Radio Guides for teachers listening to Tikwere!

Looking at the number of teachers we were able to reach fluctuated from session to session. We recognized that student teachers from the TTCs were included when they doing field teaching practice -- an admirable practice. Including student teachers insured that teachers

conducting field practice would become successful Tikwere! teachers. IPTE-ODL teacher-trainees assigned to standards where Tikwere was broadcasting were involved in the Tikwere! teacher training sessions.

### *What We Learned*

- Despite regularly training PEAs (three times a year) to deliver Tikwere! training, understand how Tikwere! works and address classroom issues that may arise out of Tikwere!, PEAs continue to have a poor track record of supervising teachers. Though each training is unique and address a new or different concern in teaching, we see little opportunity for further support of those issues if PEAs do not observe Tikwere! sessions. In some instances, PEAs do not observe teachers and in others, when they do conduct observations, PEAs may wait until the Tikwere! lesson is completed before visiting the teacher.
- The dialogue at the local level is uni-directional: DEMs communicate with PEAs and PEAs communicate with teachers, but it is rare that teachers will present their concerns or requests to receive support.
- Obtaining content for ODL assignments and exam questions from DTED proved to be difficult.
- Formative evaluation was hampered by poor cooperation from formative ODL school sites and the Tikwere! ODL team was forced to change schools several times.
- Logistics for the practical training sites used for PEA trainings need to be coordinated by PEAs familiar with the sites. MCDE will need to keep in mind that PEA training will need to be early, regularly and in coordination with PEAs who are best able to identify venues for training sites and schools to be visited which are within reach of each other.
- District personnel submit their P2P liquidation reports late. To curb this malpractice, the project introduced a pledge form which commits the DEM to account for the money. In addition we follow up with reminders where pledge forms are not yet submitted.

## *Recommendations for the future*

- The ministry has in its most recent effort to link IRI with the NPC, published a circular reminding teachers to listen to Tikwere! and use it as a part of instruction. We recommend that a similar communication be directed to PEAs and district officials. We suggest that the ministry produce language that communicates that Tikwere is part and parcel of the NPC. Observations and teacher inspections should also include how teachers implement IRI in their daily lessons. The MOEST can support the idea of 'Tikwere! Teacher'; a Tikwere representative in all the schools across the country.
- MCDE can play a role in establishing bi-directional lines of communication. Offering teachers to call in or complete feedback forms that will anonymously present their needs to PEAs, DEMs and EDEMs could create the checks and balances necessary to identify problem spots and direct assistance.
- To further support ODL, Mr./Ms. Tikwere should assist in orientating teacher trainees within their respective schools. Mr./Ms. Tikwere are now the point persons to assist where they learn last minute of Tikwere! activities or as a support after training.
- Tikwere continued to use 2 schools as formative sites in order to safeguard the quality of the programs.
- Communicating the Tikwere's education partner, MTPDS proved challenging. As both projects intervened to improve CPD. An outside body overseeing CPD would have been useful to facilitate communication between the two projects.

## IV. Other Technologies

From 2010 to 2011, Tikwere! piloted a study of classroom use of different types of technology. We tested the use of I-pads and Pico-projectors and had in our plan to test the viability of the Razor as an alternative to the Lifeline radio. The pilot aimed to

- learn whether MBC shadow areas could be addressed by sturdy MP3 players
- learn whether visual IRI would markedly increase learning gains
- learn whether video infused CPD instruction could improve teaching

The iPad study was conducted in two primary schools within Blantyre. Pico-projectors were pilot-tested in S4 classes where it was referred to as Visual IRI. TDC level CPD discussion sessions were called CPD Videos. The design, implementation and results of each pilot are outlined below. Further reporting on the study is included in the appendix.

#### ***S4 iPads***

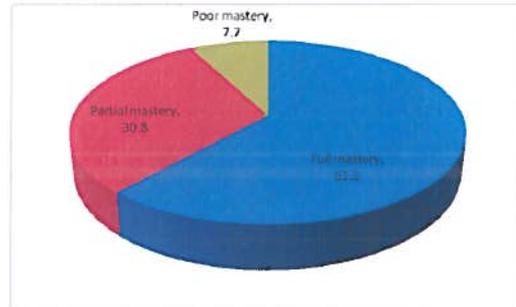
Limbe and Chimwankhunda primary schools were randomly selected for the iPad pilot study. At each of the two schools, one Standard 4 teacher was chosen to be involved in the study though more than one stream of Standard 4 existed at each of the two schools. The selected teachers were trained to use the iPad, how to play games and how to record the activities learners used on the iPad. There were a total of 200 learners involved in the study in the two schools: 74 at Chimwankhunda and 126 at Limbe.

Learners were divided into groups of 12 and each day two groups remained to play games after knocking off. The teacher guided and supervised learners during this time. Tikwere! monitored the iPad activities in schools fortnightly and provided support to teachers during the monitoring visits. iPads were used in the last two terms of the 2011-2012 school year. The findings were as follows:

#### ***Learners***

- It was evident that learners played games on the iPad because they were able to name the games that they played and talk about how to play them.
- The teacher provided guidance whenever learners had difficulties playing some games but in some cases learners were guiding each other.

- Though learners found it difficult in the beginning, they were able to follow English instructions as they played games.
- Some learners, tried to discourage those who needed more time with the games, judging that the games were too advanced for other learners. Teachers however, instructed them on the importance of the material and assigned them to be group leaders.



**Figure 12:** Performance of learners who were assessed while playing games on the iPad

- The iPad assists learners struggling with Mathematics and English. Learners showed signs of basic literacy skills such as recognizing the alphabet and understanding basic instructions in English.
- Tikwere! assessed a total of 13 learners from both schools while playing two games, one in maths and the other in basic literacy skills. The findings were as follows:
  - o 8 learners were able to play all the levels in the assigned games demonstrating full mastery
  - o 4 learners were able to play to some level but did not finish all the levels demonstrating partial mastery
  - o 1 learner who is an SNE learner struggled to play any game demonstrating poor mastery. It is worth noting that this SNE learner was involved throughout the pilot period.

### **Teachers**

- Teachers conducted this activity every day from 1:00 pm to 3:00 pm reflecting dedication on the part of the teachers. They suggested that the I-pad be timetabled within the school time just as it is with Tikwere!
- After initial evaluations, 12 learners group were changed to groups of 6 learners. This gave each group member more time to play games.

- Outside of the four hour training, teachers learned how to manipulate the iPad and play most games on their own. This was evidenced by their support and advice to learners on how to use the iPad.
- Teachers suggested that the iPad was relevant in schools and could be used in all classes depending on the type of game. Some games can be useful even in Standard 8.
- The teachers felt that the iPad was fragile and expressed concern over leaving the device with learners. This, however did not prove true as no damage was recorded.
- They established that the iPads could hold a charge for a whole week in most cases.
- In terms of design, they suggested that the iPad have a bigger screen for all learners to see in class while one learner plays the game. This design would enable teachers use the iPad game to teach some concepts or skills.

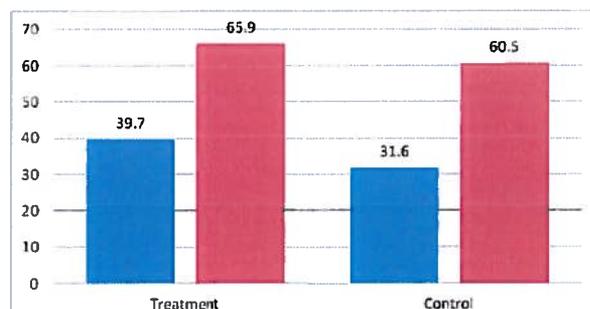
#### *S4 Visual IRI*

Tikwere! developed ten Visual IRI (video) lessons from ten of the 150 S4 IRI lessons. The selection was based on the criterion of IRI lessons containing concepts needing visual descriptions. The videos were shot in Malawi primary schools.

In order to test the relative gains, Tikwere! developed and tested items for each lesson in an S4 classroom at Ndirande LEA Primary School (formerly known as Kachere). An analysis was completed and the final test items identified.

Tikwere! then randomly selected ten primary schools and ten control schools. Two teachers from each of the treatment schools were trained to operate the Pico-projectors and use them during lessons. They were also taught how to administer the pre and post -tests. Twenty learners (ten boys and ten girls) in the treatment and control schools were randomly selected to take the pre-test and post-test. Afterward all learners listened to Tikwere! radio lessons which corresponded to the Visual IRI lessons.

The ten S4 Visual IRI lessons were taught in ten schools for two weeks. Afterwards



*Figure 13: Mean scores for the pre-test and post-test*

Tikwere! engaged teachers from outside Ndirande LEA Primary School to mark the pre-test and post-test and check the scripts for any errors. The data was entered into SPSS and overall results show that learners in treatment schools significantly performed better than their colleagues in control schools. (The p-value is less than 0.05.) The results show that Visual IRI adds value to the IRI interventions. *See Figure 14 and table 3.*

It would be ideal to develop more visual IRI lessons and pilot-test them over a longer period of time or a minimum of one term of school calendar for an n improved sample of this intervention.

**Independent Samples Test**

	Levene's Test for Equality of Variance		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
POST_OVEF	12.815	.000	3.233	378	.001	5.4127	1.67435	2.12049	8.70491
Equal variances assumed									
Equal variances not assumed			3.201	348.091	.001	5.4127	1.69119	2.08647	8.73893

*Table 3: t-test Significance Results*

## V. Publishing Results to a Wider Audience

### *Newsletter*

Tikwere! has produced quarterly newsletters as a platform for teachers, DEMs, PEAs and EDMS to share best practices. The articles in the newsletter were produced by Tikwere! staff, teachers, head teachers as well as PEAs and shared results on nationwide learners' performances.

### *DEM and EDM annual reflection workshop*

To share progress on Tikwere, since 2008 – 2012 Tikwere! organized DEM and EDM annual meetings which were attended by EDMs, DEMs and Accountants. The meetings provided updates on the project, its deliverables, performance outcomes, clarified EDM and DEM

roles in supporting Tikwere! In our last meeting in August 2012, participants discussed how Tikwere! could be sustained past project close out.

## VI. Strengthened Systems for Sustainable IRI Delivery

### *Capacity Development Plan and Tikwere Sustainability Plan*

Working with MCDE has been our five year mission. From the onset; from establishing offices, to installing a state of the art studio to training scriptwriters and testing the programs, Tikwere! has included MCDE and worked with MCDE senior management to develop MCDE's institutional memory with regards to creating and implementing Interactive Radio Instruction. To do this, we also needed to understand the structure and dynamics of MCDE and how it functions within MoEST. In 2010, when stepped up actions in working with MCDE, a new Chief of Party, Augustine Kamlongera, came began working with Tikwere as Policy Advisor and a person who could cooperatively develop the framework for a sustainable IRI program. Dr. Kamlongera worked with an IRI international consultant to develop and promote a Capacity Development Plan. The plan included, among other things, a suggested Human Resource map and job descriptions collaboratively developed with MCDE through workshops, quarterly meetings and consultative one-on-one meetings with MoEST senior staff.

In October 2010, Tikwere! in collaboration with MCDE, invited partners to determine the key issues around a capacity development plan for MCDE. The meeting paid special attention to the variety of specialized skills required for operating a functional center for Open and Distance Education Center that could continue to provide IRI.

The aim of the workshop was to define and align MCDE's capacity development requirements with the Malawi Education Sector Capacity Development Strategy Plan (I – III.) This Strategy was produced by JBS International and funded by USAID for the Ministry of Education Science and Technology.

Specifically the meeting addressed MCDE's strategic position, legal and policy alignment; leadership, coordination and communication; decentralized administration, communication and linkages; and human, financial and physical resources. The workshop produced a draft staffing plan for MCDE and sample job descriptions reflecting a realigned directorate. Both the Capacity Development Plan and Sustainability Plan were discussed in March 2012 and reviewed with USAID and MoEST in June of the same year. The documents were finalized and submitted to USAID.

On a more regular basis, the MCDE Acting Principal and an officer were invited to participate in the weekly Tikwere! Management meetings so that we could collaboratively implement Tikwere! We requested reciprocal attendance at MCDE meetings. Since 2007, however, we were asked to wait while MCDE organized its schedules.

Quarterly meetings did slightly improve the working relationship between staff resulting and if nothing else eased the availability of MCDE staff for IRI activities.

A recent training on HIV and AIDs awareness brought the two organizations together developing a workplace committee, providing information on counseling and testing, and encouraging positive living.

The challenge however was that MCDE could not sustain the few staff that were present. Each month staff trained as script writers were either transferred to other ministries. The greatest challenge was mindset. At the very beginning, Tikwere was reminded that we were a "project" and like all other projects, we would leave at one point. MCDE, located geographically outside of the ministry sphere, struggled in its awkward placement within the ministry. Although the remaining MCDE were few in number they attempted to participate in Tikwere activities. The Acting Principal, for one, was present at every available opportunity. Both Acting Principals (the first retired in 2011) availed themselves during most of the Tikwere! management meetings. In contrast to twelve Tikwere! script writers, there were only four MCDE personnel available for writing, one M&E and one Outreach Coordinator which we shared.

The most interesting development, as the project closes, is that almost several Tikwere! employees have applied to work for MCDE. In turn the MCDE is processing their applications so as not to lose the momentum of the project.

We applaud the Malawi Government's commitment to broadcast Tikwere! In 2008, the ministry began to air S1 programs. As we close, in 2012, the ministry funds programs from S1-4. MCDE has managed to increase its budget in preparation for sustained IRI delivery, but lower funding than what is required. The situation looks promising. In fact, the Acting Principal is already looking at reviewing IPTE Tikwere! before the end of October, 2012.

Tikwere has set the foundation for audio programs for primary, teacher training, CPD and out-of-school youth. We would hope that the MoEST will continue its commitment to IRI and more broadly to educational broadcasting. IRI, and distance education could be considered a plausible means to developing other government institutions such as health, agriculture, and civic education.

### *What we learned*

- Establish Tikwere in the heart of MCDE was crucial to developing a renewed sense of purpose
- It was essential to have been present in the schools and on air in order to talk about IRI and how MCDE could support it
- The PCAR coordinating committee was an important element in working with EDC to promote MCDE as a continued provider of interactive radio
- Personnel at MCDE are key; without personnel with 21<sup>st</sup> century skills, it was difficult to talk about primary education, programming and production standards.
- Revisiting the history of MCDE was key in developing strategies for capacity development. However beyond this baseline, it is up to the MoEST to take the necessary steps to see MCDE through a transition
- Change has been gradual; Over the course of five years, there have been visible changes at MCDE, though no transformations. These changes should be recognized and applauded.

### *Recommendations for continued implementation*

- If MCDE is to provide open and distance learning to a variety of structures, it will need to find a new home. Sitting under Secondary Education directorate does not promote primary or teacher education goals. Instead MCDE has the potential to support primary, secondary, early childhood, teacher education and even agriculture and vocational education
- Staffing MCDE with the right technical skills will be necessary to fulfill the first recommendation if that is the decided upon course of action
- The Sustainability Plan should be regularly re-visited. The two documents: The Capacity Development Plan and Sustainability Plan contain information culled from a great many sources. The plans should be revised and revisited on a regular basis to move MCDE toward MoEST's vision for the future.

## VII. Conclusion

Tikwere! proved to be an effective and user-friendly methodology for supporting instruction. Classrooms that use the programs on a regular basis see gains in learner performance. Teachers applaud the simplified lessons and captivating stories and characters. The radio guide gave teachers an opportunity to think about their own schemes of work against a simple and easy to follow guide. The ODL trainees, who hadn't had the experience of teaching, began to adopt many of the approaches advanced by the NPC but explained through Tikwere! Interactive Radio Instructions were complementary to the New Primary Curriculum, making teaching and learning meaningful because both they were easily implemented.

Tikwere! effectively met its obligations. All programs for primary schools (S1-4), TTC (IPTE and ODL), CBE and CPD were produced using a well-established production process. The programs were being utilized by the intended beneficiaries throughout the project.

The learning gains realized by learners in schools that were using Tikwere! radio programs is part of the evidence of the usefulness and effectiveness of the Tikwere! radio programs. MCDE will need to continue with learner assessment so that it measures the effectiveness of the Tikwere! radio programs with time.

Much as MoEST delayed in deploying staff to work in the studio and be trained in media and production, the training and involvement of MCDE as MoEST staff in various activities is a sign that Tikwere! will be continued as the skills have been transferred to MCDE by the project staff.

When it came to regular assessment, the project has shown that timely and continuous assessment is useful if the primary school education is to make positive strides in Malawi. Tikwere! worked with the ministry to enhance the PEAs' observation tool and this in turn led the Ministry of Education to support the newly designed tool. Tikwere! began its work with a very simple mandate: Develop programs for Standards 1, 2 and 3. However the success of

the program led to an expanded scope. Continuing to develop primary programs, Tikwere branched out to initial teacher training, in-service professional development, programs for out of school youth and a unique training program that combines distance education with local actors.

Staffing at MCDE became a serious concern with the presentation of the Capacity Development Plan and its related Tikwere! Sustainability Plan. These documents clearly set out MCDE's needs and in direct discussions with the Departments of Basic Education, Secondary, Inspection and Advisory, Teacher Education and Development, Human Resource and Development, it has allowed the MoEST to consider the elements and rationale for a better support directorate of distance education. The broad support of the ministry has been crucial to our ability to work with MCDE and with local education officials. We have at every turn found the ministry to be supportive of IRI and testing innovations based on the most effective way of delivering sound education training. Train often, provide a consistent message, recognize that issue in implementation will arise, but address them immediately. For example, it was pertinent to include the Department of Teacher Education and Development and all TTCs to introduce CPD and ODL teacher training. Furthermore, CBE required the involvement of the Directorate of Basic Education as well as an implementing partner – GIZ. Tikwere! sought to address policy collaboratively. This collaboration and transparency was intended to help the ministry gain a clear sense of the potential for a stronger MCDE. In the end, MCDE's budget went from MK 8 million in 2011/12 to MK 124 million 2012/13 (estimated budget submission).

Finally, the question of whether Tikwere! has been effective is incomplete if we are not to mention the importance of radio donations from USAID. The radios were key to the success of the project and its continued impact. The radio is both economical and efficient and well suited for Malawi. Though we have been able to establish radio wave shadow areas, the challenge is not greater than fifteen percent. If MBC revamps its medium wave transmission, the whole country can be reached. To reduce intermittent gaps in listenership, district radio repairers have been established. Furthermore, different sources have agreed to bear the

costs of repairs; the School Development Fund, the Enhanced Direct Support to School Funding or District Education Allocation.

Tikwere has shown the power of a national program. Pilots were unnecessary as IRI had been proven for a variety of uses and in a variety of contexts. Robust monitoring and evaluation which feed back into the system for improvements, appropriate training and government support through policy and funding are essential.

Tikwere! has successfully supported the education system in Malawi by considering its achievements both intended and unintended as well. Though EDC is phasing out it is comforting to note that Tikwere! activities will continue as MoEST and other stakeholders have embraced it. MCDE continues to broadcast programs, communicate with local education officials and encourage the PEAs to observe lessons involving IRI. This is a sign of sustainability.