THE REPUBLIC OF UGANDA

Measuring Learning Achievement 2007-2010

A summary of the MLA, findings and recommendations

School-to-School International

for

Creative Associates International, Inc.

and

USAID

June 2011

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School-to-School International

June 2011

Acronyms

Creative	Creative Associates International, Inc.
CC	Coordinating Center
MLA	Measuring Learning Achievement
MoES	Ministry of Education and Sports
NCDC	National Curriculum Development Center
PIASCY	Presidential Initiative on AIDS Strategy for Communication to Youth
PMP	Project Monitoring Plan
PTC	Primary Teachers' College
STS	School-to-School International
TDMS	Teacher Development Management System
UNEB	Uganda National Examinations Board
UNITY	Uganda Initiative for TDMS and PIASCY
USAID	United States Agency for International Development

I. Introduction

The Uganda Initiative for TDMS and PIASCY (UNITY) Project was a USAID-funded initiative which supported the development and implementation of a new, thematic curriculum designed to improve teaching and learning at primary school level throughout Uganda. In order to demonstrate the success of its efforts, the Project, in collaboration with the UNEB and the MoES, initiated an assessment exercise called Monitoring Learning Achievement (MLA) through which pupils would be tested in language and maths from P2 to P4 in order to demonstrate the impact of the new curriculum on their classroom performance. MLA was conducted annually from 2007 to 2010 This report presents the results of the MLA during that period, as well as a summary of lessons learned and recommendations for the continued implementation of the new curriculum.

II. Overview of UNITY MLA

The Uganda Initiative for TDMS and PIASCY (UNITY) Project was a USAID-funded initiative which supported the development and implementation of a new, thematic curriculum designed to improve teaching and learning at primary school level throughout Uganda. Key to the success of the new curriculum was the improvement of the quality of teacher training through which the curriculum would be introduced into primary schools from 2007-2010. Creative Associates, the company which held the USAID contract for the implementation of UNITY, supported both the development of the new curriculum and its implementation through pre-service and in-service teacher training activities provided by the MoES each year. As part of its contract with USAID, Creative Associates was required to demonstrate that "at least 70 percent of children would demonstrate higher levels of learning achievement as a result of these teacher training activities" (indicator from UNITY Work Plan of 2007).

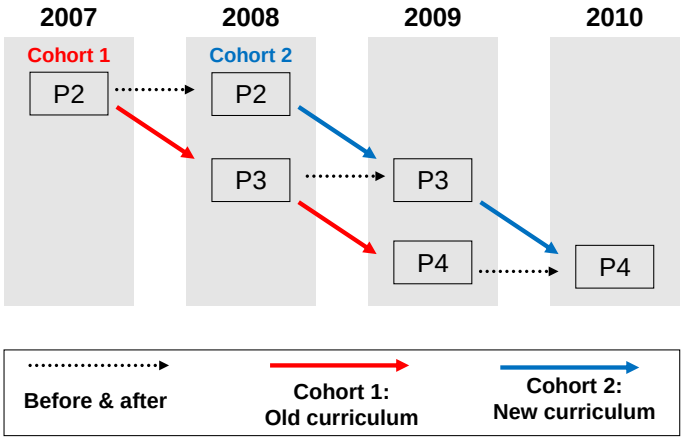
In order to demonstrate levels of learning achievement, the Project, in collaboration with the UNEB and the MoES, initiated an assessment exercise called Monitoring Learning Achievement (MLA). The following is a description of the MLA design.

Design: For MLA, a sample of pupils was tested over a 4-year period to assess the impact of the new curriculum on their learning. To do this, a quasi-experimental design was used in which the achievement of two groups would be compared. The first group - the "experimental group" – would consist of pupils attending

government schools in which the new curriculum would be introduced throughout the 4-year period of the MLA. In this group, local languages would be used as the Language of Instruction (LOI) in P2 and P3, transitioning to English in P4. The second group – the "control group" – would consist of pupils attending private schools where English would, in the main, continue be used as the LOI, a feature of the old curriculum that was considered a proxy for not adopting the new curriculum.

In the MLA, pupil achievement in the experimental and control groups was assessed with paper-and-pencil student achievement tests in language and maths (footnote: in year 1 of MLA, a set of language performance items was also implemented) measure the impact of the new curriculum. This "before and after" designed permitted measures of change at a given level – e.g., Primary 2 achievement before and after the introduction of the new curriculum. At the same time, the MLA tracked two cohorts in a panel design to compare the performance of two groups of pupils over time: Cohort 1 followed the old curriculum, and Cohort 2 was the first group to use the new curriculum (see illustration at right).

Figure 1: MLA design



Sample: A 2-stage stratified 2-stage clustered sampling design was used to select MLA experimental schools. It is called 2-stage because clusters (in this case, schools) were first selected randomly, then within each school, 20 pupils were selected randomly – 10 girls and 10 boys. Schools were stratified by the following criteria:

- *Location*: Urban, peri-urban and rural schools
- *Size*: Large and small schools
- *Ownership*: Government and private schools
- *Distance*: Larger and smaller distances from the district center
- *Boarding type*: Some of the day schools, some partly boarding and some full boarding, and

- *Gender*: Co-educational schools, boys' schools and girls' schools.

Table 1: MLA regions and districts

Region	District
Central	Mpigi
	Mukono
East	Kumi
	Soroti
North	Gulu
	Lira
West	Kabale
	Mbarara

In order to provide national coverage, schools were selected from 4 regions. Within each of these regions, two districts were selected by the MoES in collaboration with UNITY as presented in Table 1 below.

Within these regions and districts, sampling was done randomly to ensure a 95% confidence interval and a 5% margin of error while making it possible to generalize the findings of the MLA to the entire population of pupils in each area in which the MLA was conducted. The sample consisted of 116 schools and approximately 2,300 pupils each year. The following table presents the numbers from MLA 2010:

Table 2: MLA sample 2010

	Schools			Pupils		
Region	Experimental	Control	Total	Experimental	Control	Total
Central	21	9	30	419	180	599
East	21	8	29	420	132	552
North	20	9	29	399	181	580
West	21	7	28	405	140	545
Total	83	33	116	1,643	633	2,276

Test development, administration, and analysis: All tests were developed with technical guidance of School-to-School International (STS) by Ugandan primary school teachers and members of NRDC and UNEB. To develop the tests, workshops were organized and facilitated by STS during which participants developed items to be assembled into tests, then piloted and revised based on the performance of each item. STS analyzed item characteristics using Classical Test Theory procedures such as p-values and point-biserial correlations. STS also conducted a distractor analysis for each multiple choice item. Cronbach's alpha was used as an estimate of the internal consistency reliability of the tests. The final "operational" version of these tests was administered by teams of Coordinating Center Tutors in each of the 8 districts over a 5-day period each September. Local technicians hired by UNITY

were then hired and supervised by UNITY to score the tests and enter the data, which were sent to STS in North America for analysis. Several types of analyses were conducted, including:

- *Descriptive analyses*: sums, averages, standard deviations
- *Inferential analyses*: T-tests, ANOVAs, Differential Item Functioning (DIF) for language bias
- *Qualitative analyses* of responses of teachers and Head Teachers on questionnaires.

Based on these analyses, STS drafted two reports each year: a core report that summarized the findings and recommendations for that year, and a technical report including all tables and statistics generated in the analyses. Draft reports were sent to MoES and UNITY for comments which were incorporated into the final version of these reports.

The following is a summary of findings from the MLA over that 4-year period. Individual reports for each year can be obtained from UNITY and USAID.

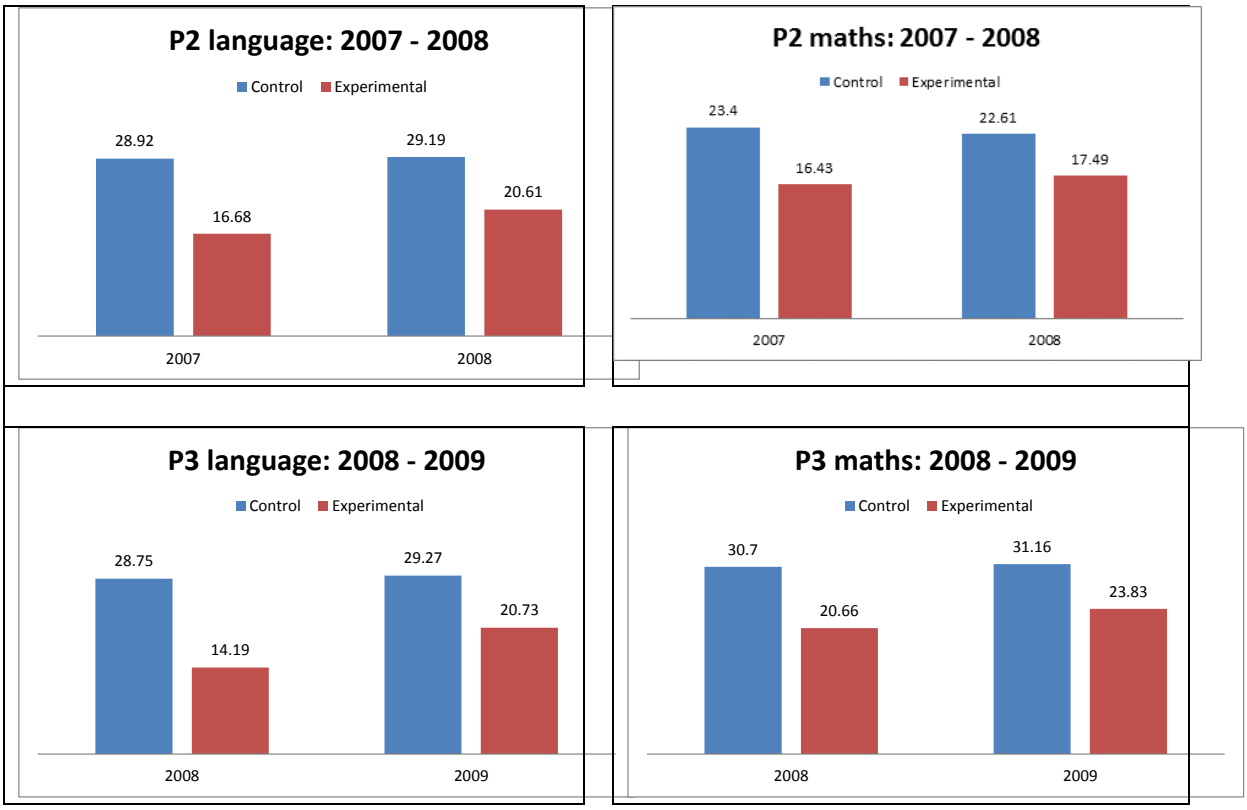
III. Findings

Finding #1: Pupil achievement remained consistent over the years within regions, districts, and language groups. Throughout the 4-year period of MLA, pupils in the Western and Central regions consistently scored significantly higher than pupils the other regions, and pupils in the Mbarara district scored higher than those in the other sevend districts in both language and maths. Pupils in the North and East regions and in the Kumi and Gulu districts scored the lowest during that period. Runyankole speakers scored significantly higher than speakers of other languages in both language and maths throughout the MLA, while speakers of Ateso and Acoli consistently scored the lowest.

Finding #2: Experimental schools saw the greatest increases in performance. From the beginning, control (private) schools scored consistently higher than experimental (government) schools in both language and maths, most likely due to the fact that private schools often perform better than government schools, and the fact that these schools were chosen through purposive, not random, sampling. However, in spite of their consistently higher performance, the control schools only

saw slight increases in performance from year to year – increases that were not significant – whereas increases in performance in experimental schools were significant both years the new curriculum was introduced with local instruction (P2 in 2008 and P3 in 2009). In effect, the new curriculum began closing the gap between the two types of schools when instruction was in the local languages, as illustrated in the following graphs. Each graph shows the scores in a single grade level over a one-year period (cross-sectional design). For instance, the mean score in P2 language for the experimental group in 2007 was 16.68 while the mean score in P3 language for the experimental group in 2008 was 20.61, which was an average increase of about 4 points. Over the same time period, the control group went from 28.92 to 29.19, for an increase of approximately three-tenths of a point.

Table 3: Mean scores of control and experimental groups compared



Finding #3: Libraries, instructional materials, and school size had positive impacts on learning. Schools with libraries and with teachers who could access materials such as dictionaries were significantly associated with higher scores in language and maths in classes where the new curriculum was introduced in P2 and P3.

Schools with more teachers, especially male teachers, scored consistently higher than smaller schools.

Finding #4: The qualifications, experience, and training in the new curriculum of teachers and Head Teachers had no discernible impact on performance. In most cases, no significant relationship could be found between pupil performance and teachers' or Head Teachers' qualifications or years of experience. Similarly, no correlation was found between the number of days of training in the new curriculum received by teachers or Head Teachers and pupil performance.

Finding #5: Pupils in experimental schools with certain characteristics – especially disadvantaged pupils – seemed to benefit most. MLA used three proxy variables to identify disadvantaged pupils: their status as repeaters, whether they had books in their homes, and whether their mothers read. On the baselines, the non-repeaters consistently scored significantly higher than repeaters, and children with books in the home and mothers who read scored higher than ones without books or whose mothers didn't read. In addition, pupils with rulers and pencils consistently scored higher on both language and maths (though teachers reported that two-thirds of pupils do not have pencils). Importantly, the introduction of the new curriculum consistently benefitted disadvantaged pupils – at times, these pupils in the experimental group showed significantly increased learning gains with the new curriculum *even when their better-off peers did not.* In addition, no significant gains were found in the control group in any of these categories throughout the entire MLA.

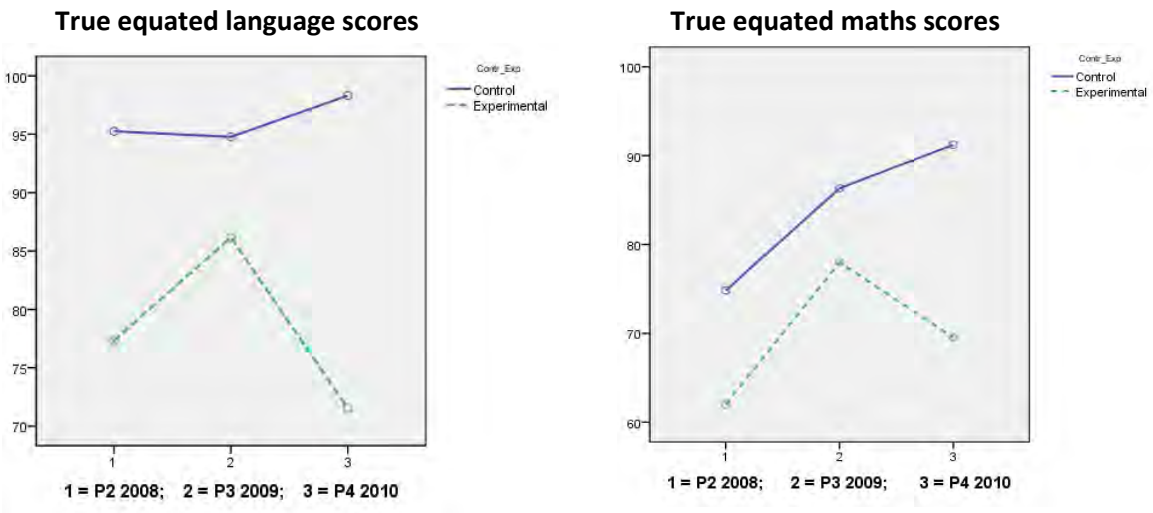
Finding #6: Gains in P2 and P3 were reversed in P4. One of the most striking findings to come out of the MLA was the decline in scores in the experimental schools in 2010 – the year pupils from Cohort 2 (the first group to be taught under the new curriculum) reached P4. While pupil performance in control schools continued to rise, performance in experimental schools declined – in the case of language, dramatically. In order to make these comparisons across years with the same group of children (panel design), it was necessary to use what are called "true" or equated scores – a type of score that has been adjusted so that it can be compared longitudinally for different grade levels.

Table 4: Control and experimental scores compared: 2009 to 2010

Group	Score/subject	Grade Year	N	Mean	Std. Deviation
Control	True_language	P3_2009	853	76.80	17.66
		P4_2010	633	89.87	14.72
	True_maths	P3_2009	853	69.76	14.67
		P4_2010	633	80.83	13.16
Experimental	True_language	P3_2009	2980	56.47	27.09
		P4_2010	1643	42.26	33.46
	True_maths	P3_2009	2980	55.99	18.58
		P4_2010	1643	52.68	19.57

The scores in the table above represent the performance all Cohort 2 pupils in both control and experimental groups. The following graphs illustrate the trend of Cohort 2 pupils followed in the panel design[1] from 2008 to to10:

Figure 2: Trajectory of language and maths scores: 2008 to 1020



Finding #7: According to teachers and Head Teachers, the curriculum reform was viewed as a qualified success. According to teachers and Head Teachers, the curriculum reform was, in the main, hugely successful. Its biggest contribution was its ability to help pupils develop a greater understanding of concepts, both in language and in maths. Teachers and Head Teachers also reported that the use of

[1] Of the initial 3,776 P2 pupils, only 673 could be followed individually and tested from 2008 to 2010 for a variety of reasons, including significantly high pupil transfer rates to other schools and high dropout rates. Given the small proportion (.18) of this group, findings should be interpreted with caution.

local language improves classroom communication, increases teacher confidence while improving their teaching skills, facilitates the acquisition of practical knowledge, increases student participation, and benefits weaker learners.

In spite of these strengths, teachers and Head Teachers consistently noted two weaknesses of the reform. The first and most pressing was the need for materials, including dictionaries in English and local languages, teachers' guides, pupils' readers, and wall charts. Some teachers complained that they were expected to teach in the local language, which required producing or translating materials themselves, yet they had none. Without reference books or other support, they were unsure about how to express key ideas in local languages.

The second concern cited by teachers and Head Teachers was the need for additional training. The training model used in the curriculum reform called for 1-2 teachers from each school to be trained, then to return to train their colleagues. Teachers and Head Teachers said that all teachers need to be trained. Moreover, the 3-5 days of training provided to most teachers and Head Teachers was viewed as insufficient for learning about the new curriculum, including its thematic structure, local language instruction, and continuous assessment, across all subjects at a given class level. This finding was reflected in the quantitative analysis, which showed that training was not helpful in increasing pupil achievement. However, there is likely a threshold above which a certain quantity (and quality) of training is beneficial for teachers. In fact, the teacher recognized this issue, and they requested additional training, both in the form of workshops as well as in in school-based support.

Finally, concerns were raised language and instruction – about teachers being able to speak local languages and community support for local languages – and the difficulty of doing continuous assessment with large numbers of pupils in the classes.

IV. Recommendations arising from these assessments

Recommendation #1: Increase the quantity of materials. In order to provide the support needed to ensure adequate delivery of the new curriculum in the schools and clasrooms, the teachers, Head Teachers and pupils need to be equipped with sufficient instructional materials. Particularly because the LOI has changed from

English to local languages, efforts must be made to provide teachers and learners with accurate and effective materials. The failure to support such reforms has resulted in failures in other countries – see Annex B.

- Identify ways to procure or produce local language materials, including readers, word cards, wall charts, and English books.
- Identify ways to obtain reference materials such as dictionaries in local languages and in English. Identify ways to obtain pedagogical materials such as model lesson plans, schemes of work, and assessment tools.

Recommendation #2: Increase training and support opportunities. As the curriculum continues to roll out, the teachers, Head Teachers and education officers will continue to need training to learn about applications in the class levels coming on line as well as reinforcing concepts introduced in P1-4.

- Provide training that consists of both intensive workshops (note that no performance gains were associated with the introductory training already provided) and school-based support.
- Ensure all teachers receive training in the use of the new curriculum.
- Provide more training in the making of schemes of work, planning lessons, and using classroom-based continuous assessment.

Recommendation #3: Provide additional support to the lowest performing pupils. The MLA consistently showed that some children are at risk and should be considered for special support in future MoES programs, and that these pupils can significantly benefit if such support is provided.

- Investigate reasons for girls' occasional lag in maths and institute appropriate remedial measures.
- Investigate reasons for lower performance in Central and Eastern regions, particularly in the Kumi and Gulu districts and among Acoli and Ateso speakers, and institute appropriate remedial measures.
- Consider the adoption of remedial programs for repeaters.

Recommendation #4: Prepare for the transition to English in P4. Perhaps the two most striking findings of the MLA are the extent to which the new curriculum improved learning in experimental schools for all pupils in P2 and P3, and the extent to which this progress was reversed in P4. Steps should be taken to prepare teachers and pupils for this transition and for study in the upper primary grades.

- Ensure that English is taught effectively from P1 on.
- Phase English in gradually from P1 to P3.
- Prepare teachers in strategies for helping pupils learn in English in P4.
- Investigate aspects of "late exit" programs that can be incorporated into Uganda's rollout of the new curriculum (see next section).

Recommendation #5: Continue to track pupil progress through P5 and P6. Because of the reversals identified in the P4 assessment, it is important to ensure that such a trend does not continue through P5 and P6. Moreover, it is important learn from the MLA and other assessments in order to capitalize on gains realized in the reform thus far and to strengthen efforts to be made in P5 and P6.

- Extend MLA to P5 and P6 by developing and administering new curriculum-based tests for those grade levels.
- Analyze the data with a particular view on providing specific insights that can improve performance in English - e.g., on topics that are causing difficulties for both teachers and pupils.

V. The way forward: Three additional considerations

> The number of years of instruction in the first language is the most important predictor of reading performance in nd language. It is not important what the first language is, but rather how much cognitive and academic development the student has experienced in it. ***The higher the students' achievement in the primary language, the faster they will progress in the second language.*** Abadzi 2010

There is now considerable consensus in the educational community that children learn best in their first years of schooling if they are taught in their mother tongue or the language of their environment. It is encouraging that the Ugandan MoES has embraced this fact, which underpins the local language instructional mandate of the new curriculum. Nevertheless, as the MLA has shown, the successful implementation of a local language curricular reform requires not only a language policy and curriculum but also sufficient materials, training and support in order to succeed.

In addition to the five recommendations cited above, three additional considerations are paramount if the curriculum reform in Uganda is to achieve the objectives it has laid out for the education of its citizens.

First, the model of LOI will in large part determine the extent to which children learn well over the course of their school careers. Many countries have opted for "transitional programs" in which children transition from mother tongue or local language (L1) to an international language (L2) as the LOI as early as Primary 4. Others continue to provide instruction in L1 through primary school – as long as P8 and beyond.

Research has shown that "late-exit" transitional programs, which develop the L1 for four to five years before switching to L2, result in better learning in both L1 and L2 than early-exit transitional programs (or programs based solely on L2 instruction). Another kind of "late-exit" program called "late-exit bilingual programs," which extends instruction in both L1 and L2 throughout the primary cycle, has been shown to lead to greater learning gains in both L1 and L2, resulting in greater cost-effectiveness than models that do not invest in L1 development (Ramirez et al. 1991, Thomas & Collier 2002, Benson 2011).

The following is a model of a late-exit bilingual program recommended by experts who specialize in instructional language:

Figure 3: Bilingual education models: Recommended phasing of LOI

Source: Benson 2004

LOI: Language of Instruction, L1: first language or mother tongue, L2: second language

Whatever model the MoES adopts for P4-6, the message from the research is that the more L1 remains a part of instruction as the LOI, the stronger the foundation for the pupil and therefore the greater success he/she will have transferring this knowledge to *all subjects* in both L1 and L2. Clearly, the pupils in the Ugandan primary schools are making significant progress in P1 to P3 through the use of L1, so this foundation should be solidified and strengthened as a part of the transition to L2.

The second consideration for future curriculum programming is that curriculum reforms which introduce local language as the LOI have often failed because they have overlooked three important lessons from the past. The following summarizes key lessons learned from over thirty years of experience in developing countries as well as research in the North on local language instruction:[2]

Basic needs of students and teachers must be met for any reform to be effective. Unless physical conditions are improved for the most marginalized it is unlikely that a change in language policy will dramatically improve educational attainment. *Significant investment of time and resources is needed in both teacher training and materials development (including linguistic development of the L1).* Cost-benefit analyses demonstrate that this investment is balanced by savings in terms of per-pupil expenditure because of significantly reduced repetition and dropout rates. *All stakeholders should be involved in the decision-making regarding implementation of bilingual schooling as well as which languages will be used and how they will be developed.* Top-down processes should enable implementation through legislation and allocation of resources, while bottom-up processes provide grassroots commitment and linguistic community support and mid-level processes facilitate educational implementation. This implies some degree of decentralization of educational decision-making.

Finally, it is instructive to look at examples of curriculum reforms in other countries in which local or multiple languages were used in the early years of instruction. International pattern in which pupils in bilingual programs often do not show gains until later years. Experiences from the US, for example, illustrate that gains in performance can take several years to be realized. In the state of

[2] Source: Benson 2004

Illinois, scores on two tests showed this trend.[3] Scores on the ISAT (reading, math and science grades 3-5) and IMAGE (reading and math Grades 3-5) showed that dual language programs may take a while to improve student's test scores, sometimes not becoming evident until the 5th grade. In these instances, researchers noted that students may be overloaded with material at the beginning, but as they progress, they do so at high levels. The message here is to be patient with dual or local language instruction: while some pupils may struggle with it early on – especially in the phase of transition to L2 – their gains will likely be realized and in the end, their learning stronger. Once the children have a solid foundation in L1 and then make the transition to L2, the achievement levels tend to be higher than if they had focused solely on L2 (as a foreign language) from the beginning.

[3] Source: http://sitemaker.umich.edu/ruchim.356/test_scores_achievement:

Annex A: Scope of Work

Creative Associates International Inc. (Creative Associates), under the ABE-LINK contract, is providing support to the Ministry of Education and Sports (MoES) in Uganda to improve education and implement the Presidential Initiative on AIDS Strategy to Youth (PIASCY). The Ugandan Initiative for TDMS and PIASCY (UNITY) project is moving forward the initiatives in basic education begun by the BEPS project. In the North, UNITY is extending Revitalization of Education Participation and Learning in Conflict Areas (REPLICA), the program developed with BEPS support, to support primary schools affected by the years of conflict.

The UNITY project is conducting an exercise called Monitoring Learning Achievement (MLA) through which Ugandan pupil learning is being assessed in order to demonstrate that at least 70 percent of surveyed children demonstrate higher levels of learning achievement as a result of pre- and in-service training activities, one of the indicators included in the UNITY PMP.

From 2007 to 2010, the UNITY project engaged the services of School-to-School International to conduct an assessment of student learning in order to measure learning gains associated with UNITY project support. Over that period, STS worked closely with UNITY and the Ministry of Education to develop and administer literacy and numeracy tests to children in P2, P3 and P4 following both the old and the new curriculum in order to assess learning gains realized under the new curriculum.

SUMMARY

This Scope of Work describes tasks to be undertaken from April 11, 2011 until May 11, 2011. The tasks will be conducted by Dr. Mark Lynd, Senior Curriculum Specialist, and Dr. Jeff Davis, Senior Assessment Specialist. They will be supported by Kathryn Brand, Program Associate. All tasks will be conducted by STTA in the U.S., with no travel to Uganda. The period of performance is 11 April to 11 May 2011.

Activities

Under this agreement, School-to-School International (STS) will complete the following tasks for the Uganda UNITY MLA project in 2011:

- Compile a report that summarizes MLA work conducted by STS for UNITY over the life of the project (2007-1010). Contained in this summary will be:
  - A consolidated explanation of all the stages and results
  - Recommendations arising from these assessments
  - Observations on what has worked well and how the MoES and other partners can strengthen these interventions, and how to address some of the negative results to improve student achievement

Create a PowerPoint presentation to summarize the highlights of this report in a succinct and visual format, to be used in a presentation to be delivered in a one-day workshop in Kampala to national Education Policy experts and stakeholders.