

2014 Study of the ABRACADABRA Literacy Software in Government Schools (Mombasa, Kenya)* August 31, 2015

Prepared by: The Centre for the Study of Learning and Performance (CSLP), Concordia University, Montreal, Canada; Aga Khan Academies Unit, Aiglemont, Paris & Aga Khan Academy, Mombasa (AKA); and Camara Education, Dublin Ireland & Mombasa Office (CAMARA).



Following on the heels of a highly successful initial intervention of the evidence-based and evidence-proven ABRACADABRA (ABRA) early literacy software (Abrami et al., 2014a & b) the CSLP in partnership with the Aga Khan Academies (AKA) and CAMARA undertook the next phase of testing during the 2014 school year. The main difference between phases was that in 2014 the intervention occurred in school computer labs dispersed around the cities of Mombasa and Nairobi, Kenya, rather than a single computer lab in the Aga Khan Academy with students from neighboring schools bused in.

With the enthusiastic support of Head Teachers and their elementary teachers, a team of Mombasa teachers, experienced with ABRA, volunteered to become Learning Toolkit (LTK) Ambassadors. Along with coordinators from AKA, and with support from both AKA and the CSLP, the local team of experts took responsibility for the overall training, mentoring and support of new teachers and new schools joining the project.

At the same time, AKA and CAMARA worked together to ensure that Mombasa schools were outfitted with computer labs and that ABRA was installed and internally networked in each participating school. Some of the schools were outfitted at the start of the pilot study and others were only outfitted part way through the 2014 school year, based on the level of preparedness of the schools.

Finally, in response to the need for students to have more reading material to enhance fluency and comprehension, the CSLP developed and disseminated the initial version of the Repository of ebooks and Digital Stories (READS). READS is a free digital resource consisting of hundreds of African, North American, and international stories in many languages including English with a few stories in Kiswahili.

* Address inquiries to: Dr. Philip C. Abrami, Centre for the Study of Learning and Performance, Concordia University, 1455 De Maisonneuve Blvd. W., Montreal, Quebec, Canada H3G 1M8. e-mail: abrami@education.concordia.ca

Nine schools consisting of 31 classes from Grades 1-3, with a combined total of 1,333 students, formed the initial experimental group. Fifteen Grade 1-3 classes with a total of 710 students served as the initial comparison group.

In January 2014 the LTK Ambassadors and AKA Coordinators trained the experimental teachers on the ABRA software and literacy pedagogy. These same ambassadors also met with the experimental teachers during bi-weekly professional learning network sessions and during occasional class visits throughout the school year. Pretesting occurred during the first several months using Level 2 of *The Group Reading Assessment and Diagnostic Evaluation*, GRADE (Williams, 2001), an internationally recognized standardized measure of reading skills. Post-testing at the end of the school year used an alternate form of Level 2 of GRADE. Post-test scores presented in Table 1 reveal that experimental students consistently outperformed control students on all GRADE subtests. Significantly higher results were demonstrated by ABRA students' on word reading, word meaning, listening comprehension and total GRADE scores.

Table 1. GRADE Posttest scores for Experimental Students (complete data available for 1,052 experimental and 517 control students)

Subtest	Group	Mean	Std. Deviation	Std. Error Mean	t-test
Word Reading	Experimental	25.01	3.87	0.12	5.63*
	Control	23.73	4.82	0.21	
Word Meaning	Experimental	22.08	3.42	0.11	3.95*
	Control	21.28	4.39	0.19	
Vocabulary Comprehension	Experimental	47.08	6.43	0.20	5.41*
	Control	45.01	8.36	0.37	
Sentence Comprehension	Experimental	9.82	4.05	0.13	1.07
	Control	9.58	4.46	0.20	
Passage Comprehension	Experimental	11.58	5.42	0.17	0.34
	Control	11.48	5.41	0.24	
Reading Comprehension Composite (SC + PC)	Experimental	21.39	8.14	0.25	0.75
	Control	21.05	9.05	0.40	
TOTAL Score (VC + RC)	Experimental	68.47	12.74	0.39	3.29*
	Control	66.07	15.31	0.67	
Listening Comprehension	Experimental	10.18	3.39	0.10	5.66*
	Control	9.16	3.23	0.14	

* $p < .05$.

Achievement results

Children's progress during the school year combined with the use of the ABRA literacy software contributed to their significantly higher reading scores than that of their peers taught without ABRA, as measured by a standardized and internationally recognized measure of early literacy. There was also anecdotal evidence that end of year examinations were higher for students in the ABRA experimental group. For example, one Head Teacher expressed particularly strong and vocal support for the continued use of ABRA after noticing very substantial gains from a class where the teacher's level of implementation was especially high.

Ecological gains

The enthusiasm of Mombasa schools—head teachers, teachers, and students-- to embrace ABRA, and the new digital repository of stories, READS, is a strong signal of the importance attached to early literacy and the value to educators of using ABRA integrated into instruction. Additionally, biweekly planning meetings, well attended by ABRA teachers, provided useful opportunities for ongoing professional development including sharing of lesson plans and experiences by the teachers. Experimental teachers were able to extend the national curriculum linkage by developing more lessons linked to that curriculum. At the same time, the LTK Ambassadors and AKA Coordinators were able to manage the training, follow-up and testing with minimal guidance from the CSLP and with the support of AKA. There is also ongoing interest among various levels of local, regional and national government to be actively involved in future endeavors. Finally, CAMARA was able to update old computer labs and build new ones with refurbished equipment in a short timeframe and in an exceptionally cost effective fashion.

Strong interest in using ABRA was also shown in other parts of the Coastal Region and throughout Kenya. With the collective resources at our disposal, we were able to introduce and support ABRA in two schools in Nairobi and hope to extend the project further in the months to come.

Practical challenges

Following lab installations and configurations, there was subsequent evidence that there were challenges during the school year with individual machines and lab intranets that prevented some classes from optimal use of ABRA. The heavy lab traffic combined with teachers and student inexperience as well as the use of refurbished equipment required a higher than normal rate of follow-up technical support that was not expected. In future, more surveillance will be done and a greater level of support will be planned and provided.

Pre-testing scores were initially included in the analyses but were dropped due to pre-test data collection concerns. In particular, teachers administering the tests gave assistance to students especially during pretesting. In addition, the control group participants could not be easily matched to their experimental counterparts. Finally, we had challenges with basement effects for all students from the youngest grades. In future, we will use lower levels of GRADE to collect data from the youngest students. The LTK Ambassadors will do all group testing; they will be additionally trained on strategies to minimize testing irregularities.

Conclusion

Strong enthusiasm and interest remains for ABRA as a tool to promote the development of reading skills amongst Kenyan youngsters. The 2014 study demonstrated this and uncovered ways that the intervention can be strengthened in the future. We will use the findings from the 2014 study to improve the 2015 project and beyond.

References

- Abrami, P. C., Wade, A., Lysenko, L. V., Marsh, J., & Gioko, A. (2014a). Using educational technology to develop early literacy skills in Sub-Saharan Africa. *Education and Information Technologies*, Advance online publication. <http://dx.doi.org/10.1007/s10639-014-9362-4>
- Abrami, P. C., Wade, A., Lysenko, L. V., Marsh, J., & Gioko, A. (2014b, February). *A study of ABRACADABRA early literacy software in Mombasa, Kenya: Phase one and two final Report*. Montreal, Canada: Centre for the Study of Learning and Performance.
- Williams, K. T. (2001). *Group Reading Assessment and Diagnostic Evaluation (GRADE)*. Pearson Education Inc. Available at: <http://www.pearsonassessments.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=GRADE>