Liberia Afterschool Programs: A Pilot Study Using KA-Lite in a Remote Rural County

Year One Report

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Executive Summary

This report presents the results of an independent evaluation of The Samuel Morris Scholar’s Pilot Program initiated by Innovative Education Liberia (IEL) in a remote, rural county of Liberia during the 2015-2016 academic year. The aim of the pilot was to find and evaluate instructional methods that have the potential to accelerate the learning processes of Liberian students by introducing a personalized approach to mathematics education using KA-Lite, an off-line version of Khan Academy. This pilot provided schools with laptops equipped with KA-Lite and the components of mathematics from math basics through college-level math. Access to KA-Lite for most of the year happened after school only, with most students receiving one or two hours on the computers per week. Only one pilot school had access during the regular school day in the last quarter of the year.

The independent evaluation was conducted by Northwest Nazarene University’s Doceō Center between September 2015 and May 2016. The Doceō Center utilized a mixed methods design that combined both quantitative and qualitative methods. The over-arching question the researchers sought to answer was: Can Liberian students in grades 5, 6, 9, and 12, using KA-Lite as a resource, experience greater gains in mathematics scores compared to a control group with traditional mathematics instruction. NWEA’s Measures of Academic Progress (MAP) assessment and a paper and pencil diagnostic mathematics test were used to evaluate growth throughout the year. Students and teachers participating in the pilot were interviewed to determine if there were other perceived benefits to including KA-Lite in the mathematics curriculum.

The results of this study were derived from interviews with 16 teachers and students along with the quantitative data of 334 pilot and control students from eight schools in a rural county of Liberia.

NWEA MAP assessment results of both pilot and control students in the beginning of the 2015-16 academic year confirmed that Liberian students in the 5th, 6th, 9th and 12th grades were far behind their expected
level of math competencies. Scores from the eight rural schools show that students in the 5th-6th grade are performing at the 1st grade level in comparison to their American counterparts. 9th and 12th graders are performing between 2nd-3rd grade level compared with U.S. norms.

Qualitative analysis from interviews with both teachers and students determined three key findings:

1. Learning is extended with the use of technology and KA Lite in the pilot classrooms. Teachers and students agreed that learning taking place with the use of the computers went further than learning in the traditional setting. Students learned about computers and many other subjects that were beyond basic mathematics.

2. Student engagement increased in the pilot classrooms as demonstrated through independence, willingness to persist, working at one’s own pace, accelerating learning, and mastery learning. Teachers noticed that the students were more interested and focused than students who were not using the computers.

3. Students and teachers encourage expanding access to the Samuel Morris Scholars Program to more grade levels, more subject areas, more students, and longer and more flexible hours of operation. While grateful for the use they had, both the teachers and the students recommended that other subjects and other grade levels be included in the pilot. They saw the benefits and wanted others to experience that benefit.

Quantitative results were mixed, but generally favored the performance of the pilot group. In particular, a higher percentage of pilot students saw growth from fall to spring in their MAP and Diagnostic Test scores compared to their control group counterparts. Sixty-six percent or nearly 2/3 of pilot students posted growth on the spring MAP assessment compared to only 53.8% of the control students. On the paper and pencil diagnostic test, 68% of the pilot students increased their scores from fall to spring compared to only 56.7% of the control students.
Grade level analysis of RIT scores shows several key findings, including:

1. Fifth grade pilot students showed consistent, strong growth (almost meeting the NWEA growth expectations for their fall RIT level) from fall to winter to spring.

2. Twelfth grade pilot students doubled the growth of their control group counterparts, moving their overall RIT score average from below the control group average in the fall to above the control group average in the spring.

3. Ninth grade control group outperformed the pilot group in overall RIT score average and growth. The dominant part of this performance was for males in the control group. Female pilot students in the ninth grade outperformed their peers in the control group.

4. Fifth, sixth and twelfth grade pilot groups posted higher spring mean RIT scores and higher percentages of students who increased their RIT score than their control group counterparts.

Grade level analysis of the diagnostic paper and pencil test scores returned results that were similar and parallel to the RIT score analysis.

Analysis by gender indicated that males were consistently outperforming females in the percentage of students increasing their RIT or diagnostic scores. One exception was in 12th grade where a higher percentage of females in the control group saw growth and females in the pilot group matched the percentage of males with growth. However, there were only four 12th grade female students in the pilot. Overall, males posted higher RIT scores than females in both pilot and control groups.

**Recommendations based on this study**

1. Increase the time each student spends on KA-Lite. Using KA-Lite only in an afterschool program does not appear to be enough to allow students to make up for their deficit in math. In March of the first pilot year, one school expanded their use of KA-Lite to include its use during regular class periods.
Early indications from these results would indicate that increasing the time on KA-Lite will increase the growth a student experiences academically.

2. Evaluate the use of KA-Lite as the primary source of curriculum. Rather than have teachers write the standard curriculum on the blackboard for students to copy and then add KA-Lite after school, consider the teacher as a facilitator of KA-Lite as the central source of curriculum.

3. Increase the amount of professional development given to teachers and the frequency of that professional development throughout the year. We recommend that teachers receive regular instruction (at least quarterly) in the use of the computers in education, but also in areas of classroom management and other instructional strategies that would support this method of education. This professional development should be offered to all teachers, not just the math teachers in the pilot.

4. Continue to expand the implementation of pilot schools, but also increase the size of the control group. As the pilot and control groups expand, put measures in place to increase the percentage of students that take MAP in September and also return to take MAP in May. A great deal of valuable data from the pilot was lost because students did not take both the fall and spring assessment.

5. Re-write the pencil and paper diagnostic to address each of the NWEA subgroups. It does not appear that the diagnostic test assesses the same areas of knowledge that MAP assesses. Aligning the diagnostic test to the NWEA math subgroups should positively influence the strength of the correlation between the diagnostic and the MAP.

6. Consider the merit of adding more students in grade 5 and 6. In this early study, the 5th grade students showed the greatest growth. Perhaps the long-term effect on Liberia could be greater by giving students a stronger foundation in mathematics.

7. Encourage female students to stay in school through the high school years. This study indicated that female students were learning math through this pilot, but the number of girls decreased dramatically in the higher grades.

8. There is a need for a second year pilot that uses KA-Lite as the primary curriculum model where traditional teaching is replaced with personalized computer-based learning. This approach appears to have the greatest potential to increase math acquisition with little risk to students who are already lacking in their mathematics skills.

9. Finally, researchers believe IEL and Liberia’s education leaders should stay the course. The greatest limitation to this study is that it may be too early in the project to see the most dramatic results. Data from interviews indicate the use of KA-Lite was very minimal in the first half of the year and it was not implemented with fidelity until late in the school year in many cases.