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Berkshire Wireless Learning Initiative Final Evaluation Report

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Executive Summary

This final report examines the impacts of the Berkshire Wireless Learning Initiative (BWLI) a pilot program that provided 1:1 technology access to all students and teachers across five public and private middle schools in Western Massachusetts. Using a pre/post comparative study design, the current evaluation explores a wide range of program impacts over the three years of the project's implementation. Specifically, the current document summarizes the background, project implementation, study design and methodology, and subsequent results detailing how teaching and learning practices changed when students and teachers were provided with laptops, wireless learning environments, and additional technology resources through participation in the technology pilot program. Specifically, pre/post student surveys, pre/post teacher surveys, teacher interviews, principal interviews, pre/post student drawings, and an analysis of student achievement results were employed in determining the impacts of the BWLI program.

There are many potential ways to summarize the findings and outcomes of such a complicated and rich learning initiative. One of the most universal findings in the current study was that both the implementation and outcomes of the program were somewhat varied across the five 1:1 settings and over the three years of the student laptop implementation. However, a number of common trends across the various research results directly address the original four targeted BWLI outcomes.

Enhanced Student Achievement

There is emerging evidence that student achievement was positively enhanced through the types of educational access and opportunities afforded by 1:1 computing through the BWLI program. Specifically, the analyses of the pass rates on all of the available MCAS subject tests during the years when 7th and 8th grade students had full access to 1:1 computing saw growth compared to past averages as well as comparison school performance and state averages. After controlling for

prior achievement levels, student level analysis of 8th grade test performance after two years of 1:1 computing in the BWLI setting revealed a statistically significant positive relationship between BWLI participation and 2008 English Language Arts MCAS performance, but not for Math. Furthermore, a randomized computer writing study in the final year of the BWLI implementation demonstrated that students produced both higher-scoring and lengthier essays when allowed to compose and edit text using their computer, rather than the traditional paper and pencil required in the official state assessment.

In addition to the state test score analyses, teachers and principals were overwhelmingly positive in their assessment of the initiative on student outcomes. Seventy-one percent of all 1:1 teachers reported that their students' quality of work had improved through participation in the program. The school principals were even more unanimous in their assessment of the impact of the BWLI and 1:1 computing on their students. For example, all of the interviewed school leadership reported unanimously that the "BWLI program has positively impacted my student's academic achievement" and that computers helped their students "grasp difficult curricular concepts" and allowed them to "create better looking products".

Improved Student Engagement

There is strong evidence that student engagement increased dramatically in response to the enhanced educational access and opportunities afforded by 1:1 computing through the BWLI program. In their final survey, teachers overwhelmingly reported improvements in student engagement and motivation: 83% of teachers felt that engagement had improved for their traditional students, as well as 84% for at-risk/low achieving students and 71% for high achieving students. Similarly, the principal interview results were equally as positive as the teachers in their assessment that student participation in the program has led to dramatically improved student engagement in the classroom. Nearly all of the interviewed building leaders reported throughout the three-year implementation period that the majority of students responded very favorably to the laptop initiative and that students' engagement, attentiveness, and motivation was improved when they were using laptops in class. The classroom observations also found that a large majority of students clearly appeared more attentive and engaged when they were using their laptops in class which was also expressed repeatedly in many teacher interviews over the duration of the three-year implementation. Both the classroom observation and teacher interviews additionally found that student engagement could also be enhanced even when only the teacher used technology in class, such as the delivery of curriculum using technology resources.

Fundamental Changes in Teaching Practices

The third targeted project outcome was the documentation of fundamental paradigm changes in teaching, particularly teaching strategies, curriculum delivery, and classroom management. Without question, the BWLI program had major impacts across many aspects of teaching for the majority of teacher participants. In nearly all BWLI settings, teachers quickly adopted and incorporated technology across a wide variety of professional practices beyond use with students in the classroom (which had itself increased nearly four times within the first six months of the student deployment). Without question, the majority of teachers' non-instructional professional practices were clearly impacted by the 1:1 initiative—representing a clear shift in many aspects of teaching strategies and methods. In the final survey administration, over 80% of BWLI teachers reported that the delivery of curriculum within their classes had changed since their schools began the BWLI program. In addition, just under 60% of responding teachers believed that their school climate had changed as a result of the program and over 50% of teachers further believed that their role as a teacher within their own classroom had changed. In assessing the impact of these changes in their own teaching, teachers were nearly unanimously positive (or neutral) with 62% of BWLI teachers reporting that their teaching had “improved as a result of the 1:1 program” while less than 10% disagreed with that statement. In conclusion, there is ample evidence across the various research inquiries that 1:1 computing and the BWLI program substantially impacted nearly all aspects teachers' professional lives in the majority of participating classrooms.

Enhanced Student Research Skills and Collaboration

There is supporting evidence that student research skills and collaboration were enhanced by the improved educational access and opportunities afforded by 1:1 computing through the BWLI program. Certainly, in every BWLI setting students access to digital resources and tools increased exponentially with 1:1 student computing. Based on the early survey results, BWLI students and teachers quickly adopted Internet resources as a research tool and resource in the classroom. Looking across the student surveys, teacher surveys, classroom observations, and teacher interviews, there were numerous accounts of how the adoption of 1:1 computing and wireless Internet access had changed the way students access information and conduct research.

In the teacher survey, BWLI teachers reported that with the adoption of 1:1 student computing they assigned their students much more frequently to create products using a wider variety of tools and mediums than had been available prior to the program. After the third year of the BWLI program over 60% of teacher respondents reported that their students had “greater freedom of choice with regard to their individual learning style” due to their participation in the BWLI program. From these results, it seems clear that both practices and sentiments of participating students and teachers show that student capabilities to conduct independent research increased through participation in the 1:1 program.

Supporting evidence shows that student collaboration and interaction with peers increased with 1:1 computing and the BWLI program. Teachers across the BWLI settings reported increases in student collaboration for a sizable portion of their students, although not the majority. Specifically, in

the final survey teachers reported that their students interaction with other students had increased as a result of 1:1 computing for 44% of their traditional students, 42% of low-achieving students, and 39% of high-achieving students. Across all types of students, less than 7% of teachers reported decreases in student peer interaction as a result of the 1:1 initiative. In addition, 60% of BWLI principal/school leadership felt “students interact with each other more while working with computers.” Based on such evidence, we conclude that student collaboration and interaction increased for many BWLI students in many 1:1 classrooms, but the impact of the initiative on student collaboration was less universal and dramatic than many of the other findings.