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## **Preliminary Report on Saugus Union School District's SWATTEC Program**

### **Introduction**

The Saugus Union School District is currently carrying out an education reform program known as SWATTEC: Student Writing Achievement Through Technology Enhanced Collaboration. As part of this initiative, all fourth grade students in the district have been provided a low-cost Asus Eee Pc netbook computer, together with an open source Linux-based operating system, a wide array of other open source software, access to free cloud-based or online resources, and subscription to a commercial online writing and essay scoring program called MY Access!

We have conducted a small case study of this SUSD program as part of a national research project investigating laptops in education, and specifically the educational use of low-cost netbooks and open source software. The research questions for this study are as follows:

1. How suitable do teachers and staff find netbooks and open source software in these districts (in regards to cost, maintenance, size, portability, functioning, and fit with instructional needs)?
2. What do teachers and staff perceive to be the impact of netbook computer and open source software use in these districts on teaching and learning processes and outcomes?
3. What have teachers and staff found to be effective practices for implementing laptop programs with netbook computers and open source software, in terms of curriculum, pedagogy, professional development, and any other matters?

### **Research Methods**

North Park and Skyblue Mesa were selected as focal schools for the SUSD research following consultation with district personnel about what schools they would recommend to get a good look at the program and its impact on diverse elementary school students. Between the two schools, there are students from a range of socioeconomic backgrounds. In addition, Skyblue Mesa has a large number of English language learners and North Park has a special day class involved in the SWATTEC program. Research in Saugus centered around four day-long visits to the district between November 2009 and March 2010, in which the following data were collected:

Observations. Two days of classroom observations were carried out at each of the two focal schools, for several hours each day. During these days, researchers were given cart blanche to

wander between the fourth grade classrooms at the schools and observe instruction. The research team was also allowed to roam within the classroom, peer over shoulders to observe what students were working on, and engage in non-disruptive informal discussion with students or teachers to better understand what was occurring in the classroom. Field notes were taken during and after the observations with a focus on documenting how the laptops were being used and if and how such use appeared to be contributing to student learning.

Interviews. Individual or group interviews were conducted with the school principals and with seven fourth grade teachers at the two focal schools and with a small group of students at each site. The students were selected by teachers to represent a diverse group of pupils in their classes. Interviews with both teachers and students focused on how the laptops were used in instruction and participants' opinions about the laptop program. In addition, two group interviews were also held with a total of 20 teachers from five other schools that were having professional development sessions at the district office, and interviews were also held with the Assistant Superintendent of Instruction & Curriculum, the Director of Information Services and Technology, and with a District Intervention Specialist with specialization in writing instruction.

Documents. A number of publicly available documents have been collected and reviewed, including district reports on the SWATTEC program, online materials developed by teachers, and educational blog postings by students and teachers.

All of these data are being analyzed using qualitative research methods, with the assistance of qualitative data analysis software (HyperResearch) to code and analyze patterns related to the research questions.

Finally, the research team has carried out similar or more extensive case studies of laptops and learning in 11 other school districts across the country in recent years, including three districts in Maine, a district in Alabama, and six districts in California. A comparison of Saugus data to this broader data set is being used to understand how educational use of laptops in Saugus matches what is known about effective practices elsewhere.

## **Preliminary Findings**

Though data analysis has not yet been completed, the following represent our preliminary findings from the research.

Overall, the Saugus laptop program appears to be extremely well designed, thoughtfully implemented, and well received by teachers and students. Learning activities with laptops match well with what is known about how students learn best with technology. Strengths of the program are as follows.

### **(1) Teaching and Learning of Writing**

Research suggests that a focus on expository is invaluable both for improving students' education and for preparing students to participate in a knowledge economy. As the SUSD Assistant District Superintendent for Curriculum & Instruction explained in an interview,

Writing is one of the higher thinking skills. If a child can write about what they learned that means they had to synthesize it, summarize it, and have some kind of opinion about it. Where as you can give a paper pencil exam with a bubble on it with pick a number or a letter. It's not about what they know; it's about what they don't know. We are finding that writing helps kids put their thoughts onto paper. I think it also gives us a lot of information about where some of those holes are.

A major strength of the Saugus laptop program is the effective use of hardware and software tools to improve student writing. Teachers in Saugus are taking full advantage of the MY Access program and other tools, such as blogging, to create engaging writing communities in which students want to write; can access tools and resources to help their writing; and receive substantial feedback on their writing. This feedback may come from their peers who read their blogs, it may come from their teachers who use the online writing environment to insert comments on their drafts, or it may come from automated essay scoring, which provides both a numerical score and some feedback. The laptops also provide students more ready opportunities to incorporate this feedback, revise and improve their papers, and share their writing publicly when appropriate.

Teachers and students we interviewed indicated that students are writing more and better with laptops, and our initial review of first year test scores suggests that students' writing scores are improving.

## (2) Differentiated Instruction

With many California classrooms bringing together diverse student populations -- including English language learners, students with literacy challenges, and gifted and talented students -- it is often challenging for a teacher to meet individual students needs. Another major strength of the laptop program in Saugus is how it allows teachers, whether in Science, Math, English Language Arts, or Social Studies, to direct students to online readings, exercises, projects, games, or quizzes that are tightly aligned with individual student needs.

In math, for example, we observed teachers point students to free online resources so that they can practice the exact skills they need to improve. In social studies, we saw how students were working at their own level and pace in doing research on California missions. In language arts, we observed students taking online quizzes on their own independent reading or on individually designed sets of spelling words. In science students are able to access streaming videos at their own pace. All these things appear to be leading to more productive use of class time.

We also learned that the laptop program is a good match for the districts diverse students. For example, we saw how students in the Gifted and Talented Education Program had access to online resources to carry out substantive research projects in class. We also heard from a special education teacher how the laptops have been especially valuable for her students, as it provides them a means to scaffold their abilities and thus participate more equally with other students in the school. She explained that "using the laptops has greatly increased the confidence of my

students.” We also observed English language learners making use of online visual material to help them understand new vocabulary.

### (3) Making Connections for Deeper Learning

U.S. education, even in the best schools, has been sometimes criticized for being a “mile wide and an inch deep.” In pursuit of a long and growing list of individual standards, teachers and students often lack the time and resources to carry out the kind of in-depth investigation that enriches learning.

Interviews and observations suggested that the laptop program is facilitating this kind of deeper learning by helping make available resources beyond those typically involved in a classroom. One teacher explained, for example, how she set up a Skype conversation with a relative serving in Iraq to give students more of a first-hand view of the conflict there. Students followed up by writing about the topic in their blogs. Other teachers explained how the textbook only covers certain ecosystems, so they have their students go online and conduct research on additional ecosystems. And rather than just reading about data analysis and graphs, students use spread sheets to chart and analyze environmental data.

In Saugus, as elsewhere, students report that they find these activities highly engaging, and teachers also report that they are energized to teach in laptop classrooms. Most importantly, though, this engagement and energy appear tied to the pursuit of substantive learning objectives.

### (4) Sustainable Implementation

We and others have found similarly positive results in other laptop programs with larger and more expensive computers and more commercial software. However, it has been often difficult to sustain these more expensive initiatives. We thus entered this study with a real curiosity as to possible effectiveness of a laptop program using small, low-cost netbooks, an open source operating system, and, for the most part, free open source software.

Interviews and observations suggest that Saugus has chosen the right tools for the job. The netbooks and software are performing quite well and teachers report few technical problems, most of which they say are quickly and easily solved. The small form factor of the netbooks appears to be an advantage; the machines are very light and take up comparatively little room on student desks. The social networking tools created by the district allow both teachers and students the chance to collaborate online through blogs and wikis, and the wide range of free software used allows the same kind of learning activities that we have observed in laptop programs elsewhere. Most importantly the project should be more sustainable than other, more expensive, laptop programs, especially in these difficult economic times.

The district Information Services and Technology Department and its Director should be congratulated on their work both in developing this sustainable approach and in sharing the lessons they have learned with other districts. In our research project, we have interviewed educators in several other districts that have made use of resources developed by Saugus in implanting their own programs, and all are highly appreciative of SUSD’s leadership in this area.

## **Next Steps**

Our research team now proposes a second phase of this evaluation study involving a survey of teachers and students in the SWATTEC program and analysis of student test scores. This will allow a more in-depth look at the program, providing information as to uses of laptops across all the schools in the district and the relationship of laptop use to student achievement. If this second phase is approved by the district and carried out, a follow-up report will be issued later in 2010.

## **About the Research Team**

The lead researcher, Dr. Mark Warschauer, is Professor of Education and Informatics at the University of California, Irvine, and director of the university's Digital Learning Laboratory and its Ph.D. in Education program. Dr. Warschauer has published eight books and more than 100 papers on technology and learning, including, most recently, *Laptops and Literacy: Learning in the Wireless Classroom* (Teachers College Press, 2006) and *Technology and Social Inclusion: Rethinking the Digital Divide* (MIT Press, 2003). A former elementary, middle, and high school educator, Dr. Warschauer has conducted research in schools across the country and is a frequent speaker at international conferences on technology and learning. Dr. Warschauer has been joined in the research by Ms. Binbin Zheng, a Ph.D. student in Education at the University of California, Irvine, specializing in Language, Literacy, and Technology. Dr. George Farkas, Professor of Education and Sociology at UCI and President of the Sociological Research Association, will be involved in the proposed second phase of the research project.