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The Influences on Teaching Strategies and Student Achievement of Using
Laptops in the Classroom

Review of Journal Articles – Article 1

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The article reports on the findings of a two-year research study that looks at the impact of laptop computers in the classroom. More specifically, it examines the impact that laptops can have on student achievement in K-12 environments, and their influence on teaching strategies. To summarize the article, providing a laptop for each student, combined with appropriate training for teachers, results in improved learning and achievement using student-centered instructional strategies.

A quote is provided by Alfred Bork from 1985, which predicted that computers would have the same impact on delivery of education as the printing press has had on the learning process. There have been a lot of people in education over the past 20 years that want to realize Bork's prediction. Indeed, in the last decade, the ratio of students to computers in public schools has shrunk from 19.2 students per computer in 1992, to 4.0 students per computer in 2000. In spite of increased access to computers, student achievement by any measure has not risen significantly. Instead, there has been a realization that it's not enough to put computers into the classroom. Rather, the key factor influencing teaching and learning is how computers are used. In related study, cited within the article, it was observed that while all of the students in the study were given their own computers, two thirds of the teachers observed failed to use technology in ways that substantially changed their former teacher-centric approaches.

One area of computer application that is garnering increased attention is in the need for development of computer skills that are applicable to solving real-life problems. This has become an area of concentration within the constructivist segment of ISD, by encouraging student use of the computer as a tool for active inquiry and problem solving. As late as 1993, however, the most common uses of

computers in elementary schools were identified as word processing and skill games. The apparent unrealized potential of computers in instruction can be linked to challenges in designing effective instruction in general, let alone computer-based lessons that meet state-mandated content and standards of technology practices.

Teacher skills in working with technology are on the rise, yet in a 2001 study, nearly two thirds of all teachers felt not at all or only somewhat prepared to use technology in teaching. In a 2000 U.S. Department of Education study, two thirds of teachers reported never having used a computer prior to being introduced to one while working in a school setting. The question becomes one of whether the design and delivery of technology-supported instruction would be more reasonable for teachers if every student had access to a computer.

In 2002, it was estimated that more than a thousand schools were employing some form of laptop program. An obvious advantage of this is that when computers are brought to class by students, it creates a one-to-one ratio of laptop to student. A related advantage lies in increasing the home-to-school linkage. The present study, providing the focus for the article, was designed to provide additional insight into the degree to which laptop programs can have an influence on students' educational experiences and learning. The study was conducted in Walled Lake Consolidated Schools (under the pseudonym, Crossover School District), which is a relatively affluent school district of suburban middle-class families. Specifically, the program implementation was in seven schools (four elementary and three middle), where laptops were made available to students for a monthly rental fee of \$50. Many students were able to participate in the program.

The pilot began with 26 teachers in grades 5 and 6. Teachers received 70 hours of training on how to develop problem-based lessons that use real-world resources, student collaboration, and computers to reach solutions. The results showed that teaching was noticeably different in the laptop classrooms as compared to the control classrooms (which still had computers). In the laptop classrooms, teaching was based on student-centered instructional strategies, delivered by teachers who received training on teaching with technology. The study showed significant improvements in computer skills, use of computer applications for research, production, writing, and design.

Comparing science and writing scores, the results showed an unanticipated (and unexplained) mix of results. In science scores, the laptop group did significantly better than the control group. However, in writing scores, the control group did better than the laptop group. Speculation is that the laptop group relied more heavily on spelling and grammar checkers than the control group, thus development of fundamental writing skills did not receive the same level of attention among the laptop group. It should be noted that in terms of overall improvement in writing skills over the course of the year, laptop students showed much greater gains than control students.

In terms of student feedback, the majority of laptop students felt their computer skills increased, as did Internet research skills. 75% of laptop group felt that their writing skills improved, and expressed a desire to have a laptop available in the following year. Laptop teachers were similarly positive about the experience, with 100% citing an improvement in student writing skills. Teachers stated that the two most difficult aspects of managing the program were: 1.) monitoring use of the Internet, and 2.) dealing with technical problems. Laptop

parents were also given a survey as part of the district's formative evaluation process. Over 30% of parents felt their child's computer skills had improved and that having access to the laptop helped to improve research and writing abilities.

One of the areas identified in the article, clearly in need of additional research, is the influence of laptops (or lack thereof) on disadvantaged populations. Issues surrounding implementation such as ensuring equitable access to laptops within a school, safe transport of equipment, and providing service maintenance support are in need of further study and require further explanation to inform educational practice.

References

Lowther, D. L., Ross, S.M., Morrison, G.M. (2003). When each one has one: The influences on teaching strategies and student achievement of using laptops in the classroom. *Educational Technology Research and Development*, 51(3), 23-44.