Action Research: Mobile Wireless Computer Lab in the Classroom

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Abstract

Our research question is "How can a wireless mobile lab improve student learning?" This year our focus is on classroom use and the improvement of curricular connections using the notebooks as a learning tool . To bring staff and students on board with the idea, we followed a collaborative and methodical procedure to implement use of this new technology in the classroom. Frequently, the staff and resource teachers shared input on how to improve and make our experience more meaningful. Tracking devices used to evaluate our objective were: calender bookings, teacher logs, student surveys, work samples and staff reflection through anecdotal comments. Next year our focus will be to investigate using the mobile lab to better meet the needs of special needs students and create a more inclusive classroom environment.

Background

Our school is in a rural community with a population of approximately 200 students in grades JK to 8. Computers are located within classrooms and there is not currently a lab within the school. Before the current school year many staff members expressed a wish for a lab environment for their classes. Physical space and the cost of wiring for workstations were major challenges when the possibility of a lab was investigated. It was also found that our student-computer ratio was insufficient.

In 2003-2004, our staff had the opportunity to pilot a wireless mobile computer lab. This lab consists of a cart with sixteen notebook computers, a printer and a charging station. The notebooks are designed to be used on student desktops and operate in a wireless environment.

Method

Some of the critical pieces in making the wireless computer lab successful and helpful include: training staff, scheduling, training students, using staff and IT support.

During times of Professional Development, teachers worked in divisional groups to identify skills that they felt should be covered at their grade levels this year. The Grand Erie District School Board document, *Computers Across the Curriculum, 1998,* was used as a starting point for divisional discussion. Each division shared a common goal to have their students develop skills in the effective use of technology to gather, store, process and communicate information. Standards set within each division were to be introduced, reinforced, and subsequently mastered by most. It was soon realized that this year's expectations will change considerably next year, as the starting points of learning will become standard across the grade levels.

The scheduling of the mobile lab to accommodate all classes was met easily, as the school population is so small. A month by month schedule allowed teachers to sign up any day desired or block of time. The calender

schedule also worked well as a quick glance to plan ahead for future units to be taught. Additionally, the calender became a useful tracking device for noting accumulative classroom operation times. Achieving a balance of computer time across all divisions became apparent as sign-up patterns in each division were observed. The computers were used steadily, as teachers would often roll the mobile lab down the hallway and into the next classroom when finished.

The teaching staff collaborated to create a set of start up procedures and structured routines to be used by all with the mobile lab. The starting point of the mobile lab was to ensure the students understand that the notebook computers are a curriculum tool, such as textbooks and calculators. The first lessons in every grade centered around the subjects of handling and care of the laptops. After such a positive reaction from the student body, the next step was to teach and frequently review basic operations, and furthermore, concepts of use.

Information and Technology (IT) staff were used often in the classroom to instruct students on new software programs. Students worked diligently with the support staff and teachers, to gain valuable experience and genuine confidence. Each experience with the IT staff involved learning new skills, build upon those skills through exploration, and meeting goals by completing culminating tasks. The IT staff were invaluable to teachers and students alike, as they brought to light the latest software programs to enhance learning.

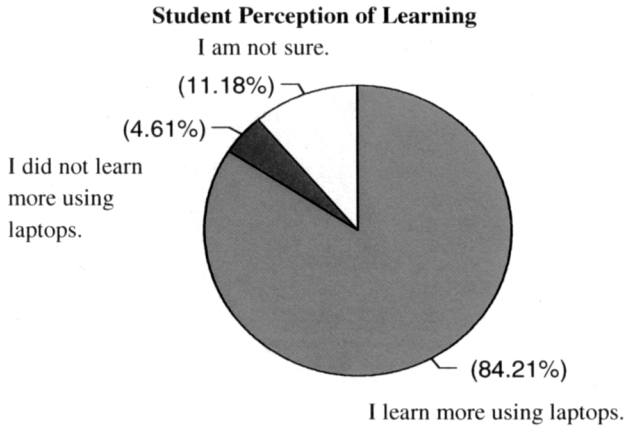
Data Collection

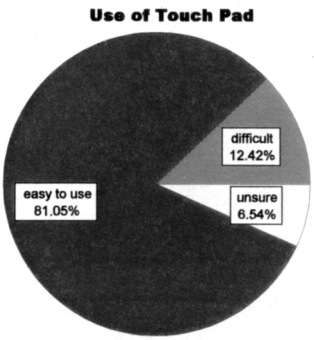
Teacher Log

One tracking device used to evaluate the question of improved learning is the teacher log. The teacher log is designed to track dates, minutes of use, software used, and planned expectations met. Over a thirty day period, the laptops were used for 100% of the instructional day of fifteen days and between 60-88% of the instructional day on the remaining days. It was interesting to see how much time had been invested for various units of study. It was found that significantly less time was spent on direct instruction, and more time devoted to student centered learning.

Staff actively presented the laptops as a learning tool rather than a toy or reward. Student perceptions reflected this as shown in the graph below.

Initially, many staff were concerned about the student's ability to use the touch pad. Yet survey results below revealed this to be a misconception.





Students helping students become more proficient on the computer was definitely evident in review of the teacher logs. Teacher log records show that within a five month period, more curriculum expectations were being explored and met in a shorter amount of time, due to multi-task computer applications. One example can be used for grade eight geography: students simultaneously use Student Link2 for curriculum activities, use Statistics Canada to gather demographic data, and also use Corel8 WordPerfect to organize and complete geography assignments. The intermediate division soon realized that students have hidden skills in which they take pride in sharing when a teachable moment arises. In our grade two-three class, a group of five students took on the role of peer coach, guiding others in the class through several activities using Student Link2 to investigate pioneer homes. As a result, students sharing their skills created an atmosphere more conducive to learning.

Surveyed Results

A second tracking device used to investigate learning was a school wide student survey. This survey was administered to the students from grades one to eight, after a period of three months of use. The survey is used to ascertain the comfort levels and perceptions of the wireless technology as a learning tool. The results show that the vast majority are quite motivated and comfortable at using the new technology.

Student Work Samples

Student work samples are proudly on display throughout the hallways, demonstrating clear examples of curricular integration. Students quickly adapted to sharing the idea with teachers that the mobile lab is seen as an "open ended" tool. At times, even exceptional students felt invincible during computer tasks or assignments. Wireless records of student achievement can be consolidated in several different ways for assessment purposes. During lessons students are expected to save to network file for teacher access and then printed off when tasks are complete.

Teacher Reflections

Staff reflections indicate a notable enhancement of student research skills and applications. Anecdotal comments suggest a significant gain in typing skills across the junior and intermediate grades. Notably, students took less time to complete typing assignments due to lessons and experience devoted to document set up and formatting.

Teachers often reflected on a student's ability to multi-task during research opportunities. Students enhanced their ability to gather appropriate information, process that information more efficiently and report to the class relevant findings. Improvements were noted in the integration of different subjects during project time. The degree of independence and understanding increased for students as they soon learned the advantage of multi-tasking in correlation to the complexity of ideas. The teacher reflections revealed a strong notion that most students feel more empowered using modern technology instead of traditional methods of communication. The mobile lab definitely motivated several learners to become more open minded in seeking out challenges. One staff member shares the following observation:

> The students are all engaged. One student was acting out at lunch hour. When he came back to the classroom, still distressed, as soon as he saw what was going on with the laptops, he immediately calmed

down and was ready to join in. The same student asked to remain after school to finish and because he was a walker, he was able to do so. Disruptions are minimal and students are on task.

Next Steps

Positive reports have emerged from staff and parents regarding the enthusiasm and co-operation among students. The survey results indicate an increased comfort level of students with the new technology. As evidenced through work samples, students have admittedly made curricular connections, resulting in an extension of their learning. As noted in teacher reflections, students are able to work more efficiently meeting more curriculum goals. The wireless lab has improved student learning, but can it exceed present standards? Can the lab improve higher order thinking skills and meet the needs of an exceptional student?

One way to improve the use of the wireless lab may be to explore different class groupings with the computers. Different physical layouts can be explored within the classroom to ensure the best environment conducive to learning. The laptops are independently moveable and can face any direction advantageous to the instructor. Students can be placed in small groups or segregated alone for concentrated learning.

Another method of enhancing student learning is change the delivery techniques to meet student learning needs. Students from different grades or divisions could form partnerships in meeting project goals. After instructions have been introduced, students need short time periods for exploration and practice on the laptops in order to warm-up to the technological change. During this time, many pupils find interesting webpages that are useful for projects of study. Making a web-wall, listing all relevant sites for the class to explore enhances student centered learning. The notebook computers are a spring board of opportunity and the students acknowledge this immediately.

The final next step to improve student learning is parental and community involvement. This would have a large impact in any school, as today's students are said to possess more computer skills than many adults. This year's after school workshop for parents was well received and another is in the workings for next year. Special needs can be addressed more intensively with small low risk workshops using the mobile lab. Parents can become more acquainted with modern software and websites that will help their child learn better. Another reason to encourage parental and community involvement with the mobile lab is to become more informed about the contemporary precautions of children surfing the Internet.

Bibliography

Grand Erie District School Board, Computers Across the Curriculum, 1998.

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