EVALUATION OF THE TEACHING MATTERS ONE LAPTOP PER CHILD (XO) PILOT AT KAPPA IV

Dr. Susan Lowes
Director, Research and Evaluation

Cyrus Luhr
Research Assistant

Institute for Learning Technologies
Teachers College / Columbia University
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BACKGROUND

In February 2008, Teaching Matters began a pilot project to give the XO laptop to one class of sixth-grade students at Kappa IV, a middle school in Harlem. There are three sixth-grade classes at Kappa IV, and the students in each class stay together for all their classes. The laptops were given first to one class first, chosen by lottery, and then to the other two classes at the end of the semester. The XO was to be used specifically for the final three units of a year-long Teaching Matters literacy curriculum, which was taught to all sixth graders, but the students were allowed to use them in other classes if their teachers allowed this. After the first two weeks, they were also allowed to take them home. Before they did so, however, the school held a meeting for parents, both to orient them to the XO as a computer and to respond to their concerns.

The evaluation was designed just as the XOs were being introduced and therefore focused on the immediate implementation. The evaluation plan was designed to look at (1) how students used the XOs, both in school and at home; (2) if the XOs were effective with the Teaching Matters curriculum;[1] and (3) whether the XOs were cost effective compared to other currently available technologies (computer labs, laptop carts, tablets). The specific goals and indicators of success can be found in the logic model in the Appendices. This report will summarize the data collected from students, teachers, and parents through a student survey, two parent surveys (before and after the XOs went home), focus groups with small groups of students (one mid-way through the semester and one at the end), interviews with the teacher and the Teaching Matters professional development support staff, and visits to two comparison schools that used other technologies (laptops and tablets). The quotes in the report come from both the surveys and the focus groups.

[1] A comparison of the class using the XO with the two classes not using the XOs, all of which followed the same Teaching Matters curriculum, is underway and should be completed shortly. This aspect of the evaluation will be compare these classrooms differences in amount of writing and Internet research, as well as the quality of the final assessments.

THE XO AT SCHOOL

The XO looks, feels, and behaves differently from the Windows-based laptops, so the students needed some instruction on the hardware and software, as well as rules on how to treat the computer. They were given during meetings with Teaching Matters staff and absorbed the instruction thoroughly. “We have to take care of it like it was a child,” as one student in the final focus group explained it.

In school, the students used the XO almost daily in their literacy class as they worked through three Teaching Matters units--Feature Articles, Poetry, and Drama. The units integrate technology in several different ways, including for Internet research and during the various stages of writing, from drafting to peer review to editing to publishing. Many schools, including Kappa IV, have laptop carts that are wheeled into classrooms on an as-needed basis, and these had been used for previous units in the literacy curriculum. But the carts are in demand and not always available, which means that the teacher has to schedule laptop use carefully, and the laptops do not all work well (parts are broken, the batteries are not all fully charged), which means that students have to share. The main in-school differences between the laptops and the XOs, therefore, were that XOs were always available, always worked, and were student-specific (each student always had his/her own XO). These simple differences had major ramifications for classroom practice.

The first and most important ramification was that **students used the XOs more than they used the laptops, which means they spent more time doing research, wrote more, revised more, and published more.** The second ramification was that the **students took much more responsibility for the XOs than they did for the laptops,** which means that they that they did not begin work only to find there were missing parts or that the battery was dead. And a third ramification was that the students were less likely to lose their work, not only because they always used the same machine but also because the XO has an automatic save feature that takes the user back to where he/she left off. Because of this, the students felt that they did not spend nearly as much time searching for, saving, moving, or reconstructing previous work as they did when working on the laptops.

When the students were not using the XOs, they kept them in a special cart in the literacy classroom, retrieving them at the beginning of class or at the end of the day if they planned to take them home. During the pilot, only the literacy teacher had support using the XO, so students were not allowed to take them to other classes without permission from the teacher of the other class. Nevertheless, the students reported that they also used the XOs occasionally in Greek, Social Studies, Math, and Music, primarily for research, writing, calculating, and chatting (see below).

Why the students liked the XO

In the focus groups and in the final survey (returned by 21 of the 24 students in the class), the students talked and wrote about what they liked best about the XO:

(1) They liked it for writing because typing was faster and more legible than handwriting, and they felt that this allowed them to write more:

- "Instead of writing u can type it which is faster."
- "If you write sloppy, the XO helps make it clearer."
- "I write more essay and other ELA activity."
- "That we just typed the notes instead of writing it down, which was easier."

(2) They liked it for going on the Internet:

- "The fact that you can go on the internet."
- "The internet and the games."
- "The best thing is that we can do research in class in stead of going to the library and wait to go home."

(3) They liked it because they could take work from school to home easily, especially to do homework:

- "The thing i like best about the xo is that i can take it home wit me and finish the lesson and complete the focus topic."

(4) They liked its physical characteristics, including that it was made for kids ("extremely cute"), that the keyboard was quiet, and that it was not as heavy as a regular laptop:

- "All the things u need are on the key board just in case the mouse doesn't work, also it is stylish and fun for kidz."
- "I like the style and i like the fact that we get to use them and i also like that the home button is where the keys are so that we don't have to click to it. i also like the mouse."
- "It's made for kids and it has internet connection."

- “I like that it is portable and that it is not like a regular laptop so you can put in your book bag.”
- “I like it because it’s more easier for us to carry around.”

(5) They liked the hardware and software that allowed them to share, including the camera (which, as they pointed out, came with the XO so you did not have to buy it) and the chat software:

- “I like many things about the xo. One thing that I like is the pictures and videos. I also like to chat.”
- “I like that i could chat with my friends without using the internet. And also that it has a built in camera.”
- “The camera and all the programs.”
- “I like that it has a camera to record and take pictures.”
- “The thing that i find best the xo is that there is a camera to take pictures, record, and for audio. Also there is a handle to hold the xo from, regular computer or laptop doesn't have that and you can chat with your friends that have them.”
- “What I like best about the xo is that it has my programs and that it is kind of easier [and] that it is fun to play with the record and the chat.”
- “I like the games and especially the pippy game. It is really fun. Also the internet.”
- “What i like about the xo that it can connect to wireless internet and also i like to play with it the video is really cool.”
- “You can chat with your friends and share your work.”

(6) They liked that it was theirs, which meant that they could always find their work:

- “Every child has one so no one has to share.”
- “Can write and save and it will be there when you come back.”
- “Doesn’t matter if you save because you can click on it and it opens up.”

(7) And finally, they liked the novelty of it:

- “It’s fun for use in class, and all the other kids get jelouse [just joking].”
- “That we can show them off to the other class that don’t have them.”
- “Getting to have fund and experience something that many people do not have but at the same time having fun.”
- “We were the first ones.”

What the students did not like about the XO

The chat feature was very popular, and not being able to use the XO in their other classes at school was one of their main complaints ("the teachers don't let us chat," "we don't get to chat"). The other complaints had to do with what the students described as the computer "acting up":

(1) They disliked that it seemed slow, even compared to their school laptops:

- "It takes a lot of time to upload."

(2) They disliked the frequent freezes, which sometimes meant they lost their work:

- "It is very delicate and sometimes freezes."
- "The screen freezes."
- "I lose my work when I am in Writing Matters, it freezes and the Internet shuts down."

(3) They disliked the consequent need to reboot frequently:

- "The notebook closes down when it freezes."
- "It keeps on freezing and shutting down by itself."
- "Sometimes it freezes and you have to reboot it over and over again."

(4) They disliked the "jumpy" cursor (which they thought of as the mouse):

- "The mouse jumps around."
- "The mouse acts up."
- "The mouse goes around."
- "When I hit the mouse the thing go somewhere else."
- "The mouse is moving everywhere."

(5) They disliked it when the journal disappeared:

- "The journal gets deleted."
- "The journal disappears."

(6) And they really disliked the firewalls that prevented access to sites like YouTube and MySpace--a school issue, not specific to the XO, but annoying to the students nonetheless.

In the focus groups, the students seem resigned to dealing with these problems. Because they had ongoing access to the XOs, and perhaps also because they are young, they were not as frustrated as adults might have been and not as frustrated

as they might have been if these had been laptops from the laptop carts, but they did seem to interrupt the flow of work.

The students disagreed as to whether they would have preferred a Windows-based laptop. Those who argued that they would said this was because a regular laptop could run programs that the XO could not run, because it was more familiar, because they did not need something that is "child-proof," and because the Internet "looks better" on a Windows machine. Those who said they preferred the XO liked the fact that it had been designed for children—"It was special that they made this for kids"—and also that having a machine made for adults was "boring."

Although most of the software that the students reported using at school was related to schoolwork—the Internet for research, the writing program, and the chat function—as the following table shows, a few students reported that they experimented with every program:

Software	**Number who used at school**	**Total responses**
Browse (Internet browser)	21	21
Write	20	20
Chat (Instant Messaging)	20	21
Record (camera)	17	21
Journal (main storage and activity application)	16	21
Terminal (linux prompt for admin)	15	20
Record (video)	14	21
Record (audio)	12	21
Calculate	8	21
Log Viewer (log viewer)	7	21
Paint	6	21
TamTamjam (audio mixer)	6	21
TamTamEdit (audio editing)	6	21
Pippy (python programming)	5	21
TamTamSynthLab (audio mixing)	4	21
TamTamMini (audio editing)	4	21
Measure (graphing frequencies)	4	21
TurtleArt (painting/designing)	3	21
Acoustic Tape Measure (audio to measure distance between XO's)	3	21
Etoys (create your own "toys")	2	21
Memorize (memory game)	2	21
Analyze (wifi utility)	2	20
News Reader (RSS feed reader)	1	20

The students also reported that they used the share function, which allows them to access each other's screens. In addition, they all reported that they used the ability to rotate the screen to "share" it with other students, which they said they did frequently ("You can keep typing when you turn it.").

Although the students saw the advantages of the XO in terms of its various specific functions or pieces of software, **one theme that ties all these reported activities together is the several ways that the XOs allowed students to share:** whether they were using the XOs for writing, taking photos, making videos, chatting, or whether they were rotating their screens or using the software to share them virtually, they were in every case sharing their thoughts or sharing their work. As we will see in the next section, the inability to share when off the school network was one reason the XOs were used less at home than they might otherwise have been.

THE XO AT HOME

How the XO was used at home was evaluated through student and parent surveys, and was therefore based on self-report. The first parent survey, administered at a well-attended parent meeting held before the XOs were distributed and returned by 17 parents/guardians, was designed to assess existing computer and Internet access at home. Almost all the families reported that they had at least one computer at home; only one had none and one had two.[2] However, only 11 of the 17 reported that they had Internet access (primarily through cable) and only three of these had a wireless network. This meant that most of the students would not be able to access the Internet at home without some help (see below).

It was also important to know how much access the student had to the home computer. In most cases, they were shared: about half of the parents reported that the computer was in a family room, while the rest said they were in the student's bedroom, the parent's bedroom, or another child's room.

The parents' estimates of how often the child who was to receive the XO currently used the computer at home varied widely, from several hours a day to once every few days:

	Count
More than 2 hours a day	2
1 to 2 hours a day	5
Less than 1 hour a day	1
Once every few days	6
Once a week or less	2
Total	16

For most of the students, then, it seemed likely that the XO would give them considerably more computer access at home than they currently had, although whether it would give them access to the Internet as well was much less clear.

After about two weeks, during which they learned the rules about caring for the XO and how to use the software, the students were allowed to take them home. They did not do so every day, however. In the student survey, administered after about

[2] Note, however, that not all families were represented at the meeting and it is possible that those who came were those who had the greatest access.

three months, most students reported that they took the XOs home several times a week:[3]

	Count
Every day	2
Almost every day	6
Every few days	9
About once a week	2
Total	19

The safety of carrying a computer to and from school has been an issue in other laptop initiatives in New York City. In this pilot, none of the students reported that they felt unsafe carrying the XOs to and from school, primarily because they fit easily into their backpacks or book bags and were hidden from view. As one student wrote, "If i have it out then somebody can probably steel it from me (and they wouldnt even ask!) but i keep my xo so that no one can see it."

In the focus groups, they reported that the frequency with which they took the XO home depended in part on what their homework assignments were for that night and also on whether or not the teacher told them to use it. However, they also said that they would take it home more often if they were using it in all their classes, especially if it replaced all the textbooks, binders, and notebooks that they normally carry.

Lack of access to the Internet was the first of two problems they had at home. Only 12 of the 19 who responded to these questions reported that they were able to get Internet access at home, and this was not only because they found a wireless network in the neighborhood. Most had no way to access their family's cable or dial-up connections. They were very frustrated that when there was "no connection," primarily because they could not chat or go to such Internet sites as YouTube and MySpace. It was clear that the students would have used the XO more at home, and taken it home more frequently, if they had had better access to the Internet when they did so ("Sometimes its boring if you can't get on the Internet.").
The second issue at home was the demands of other family members. Over half of the parents reported that there were five or more people living in their home, so it is not surprising that most of the students (12 of the 19 who answered this question on

[3] Although 21 students responded to the first part of the survey, which covered general impressions and school use, only 19 completed the sections on home use.

the survey) reported that they shared their existing home computers with other members of the family. It was hoped that the XO would give these students more time with a computer, and while this does seem to have been the case, the sharing went the other way as well. Thus the students reported that the XO was used by many other members of the family, including mothers (14), siblings (14), fathers (8), grandparents (4), and other relatives (4). However, when asked to list the best thing about having the XO at home, only one student wrote that the best thing was "that i have my own one and i don't have to share." Others wrote the opposite--that the best thing was being able to share with the family:

- "I can show it off to my mom and my brother and my dad."
- "Me showing my sister what it can do and going on the internet."
- "The best thing i like to do when i am at my house is that i use the camera and we do crazy thing good times good times."
- "That you can show your friends."
- "I can explore it freely and i can share the joy and excitement with my sister."
- "My mother won't let it go. She acts like a kid with it."

Many of the students integrated the XOs into their everyday lives, taking them wherever they went. About half (11 of the 17 who responded to this question) reported that they had taken their XOs when they went to visit friends and relatives (some as far away as Canada, Ohio, and Pennsylvania), as well as to the public library (5), the park (1), the hospital (1), and to a parent's job (1).

While the students reported that they used the same software programs at home as at school, they used the "fun" ones (camera, video, audio recording) more frequently at home and experimented with many additional programs as well:

	Home	Total
Record (camera)	21	21
Journal (main storage and activity application)	20	21
Browse (Internet browser)	19	21
Record (video)	19	21
Record (audio)	18	21
Write	17	20
Paint	17	21
Calculate	16	21
TamTamjam (audio mixer)	15	21
TurtleArt (painting/designing)	15	21

TamTamSynthLab (audio mixing)	14	21
Memorize (memory game)	14	21
TamTamEdit (audio editing)	13	21
TamTamMini (audio editing)	13	21
Measure (graphing frequencies)	13	21
Log Viewer (log viewer)	12	21
Etoys (create your own "toys")	11	21
Pippy (python programming)	10	21
Acoustic Tape Measure (audio to measure distance between XO's)	9	21
Terminal (linux prompt for admin)	9	20
News Reader (RSS feed reader)	7	20
Analyze (wifi utility)	6	20
Chat (Instant Messaging)	1	21

When asked if there were existing functions that they would like to use more frequently, they listed the creative software (Etoys, TurtleArt, and TamTamEdit) that could have educational uses but are not currently integrated into the Teaching Matters curriculum.

Student suggestions for changes to the XO

The final question on the student survey asked for three changes that would make the XO better. The students had a total of 44 suggestions. Fourteen related to the previously noted problems of speed ("faster," "freeze less") and blocked websites ("unblock websites"). The rest were varied, with no consensus among them. Four suggestions related to the keyboard ("larger keyboard," "bigger keys," "change keyboard to one you can see at night," "larger mouse pad"), three wanted better games ("easier games," "change some hard games to fun games"), three wanted to change the look ("better colors," "better background on the home page," "more than three icons"), and two wanted the volume to be louder. The issue of games came up in the focus groups as well, where the students explained that they felt the games were too hard and also needed some Help screens to get them started ("They don't even explain it, they just expect you to do it.")

The students were also asked to list three additions that they would like made to the XO. There were a total of 40 suggestions. Some of these referred back to the issues listed above, but rephrased as additions ("better Internet connection," "ability to download," "fast Internet," "different colors for the XO"). Seven wanted more games.

Other suggestions were for additional hardware: five suggested adding a touch screen (“so if the mouse is crazy you can do it with your fingers”), four suggested adding a stylus or pen, four suggested adding a printer (“a small printer”), and one wanted “lights on keys.”

In the focus group, the students were asked what rules they thought should be in place for the next group to get the XOs. Most of their suggestions had to do with avoiding the issues that had come up during the pilot, as well as generally resisting the temptation to test the XOs limits:

- “Don’t pour water on it.”
- “Be careful not to let it fall when it’s open.”
- “Don’t let it fall at all!”
- “Make sure you don’t rip the keyboard.”
- “Don’t rip off the antenna.”
- “No babies around.”
- “Don’t touch other people’s XOs.”
- “Don’t let strangers take it, even if they are your friends.”
- “Don’t unplug other people’s chargers.”
- “Use it wisely.”

And finally, they felt that they should be able to use it more:

- “We should use it in every class, instead of our binders and our folders and all that stuff, only the XO and that’s it.”
- “Every teacher should allow you to take it.”
- “We should be able to use it if we’re done with something.”

PARENT EVALUATION

Eighteen parents returned a survey given in May, after the students had been taking the XOs home for about three months. Like their children, none expressed concern about the safety of bringing it back and forth, mostly because it was hidden in the child's backpack:

- "No. The teachers and I explained that they should be kept in the backpack at all times when walking to and from school."
- "I had concerns because I feel someone can take it from her but I don't have them anymore b/c she keeps it in her Backpack."
- "No, he's very careful he doesn't flaunt it on the subway. It is kept very safe in his backpack."

The survey asked if they had other concerns about the XOs. Only one parent did, and that had been about Internet safety: "I was concerned about online safety. Not anymore." This concern may have been allayed because the parents had been shown how to track what the students were doing through the journal; according to the students, some of their parents did do this. In addition, only three parents reported problems with the XO itself, and these were the same ones their children had noted: that they did not have Internet access (2) or that the XO kept freezing (1).

The parents were asked if it had been a good thing to have their children bring the XOs home and, if so, what had been good about it. Most wrote that it had been helpful for homework:

- "Good because she does her literacy homework."
- "Yes she gets to do research for her class homework."
- "She's been able to do H.W. on it."
- "Yes because she does her writing on it."
- "Yes, for doing her homework and using the writing software."
- "Yes it has been good because so he can have a laptop to do thing on."
- "It been a good thing because [my child] does her reading log on the XO and she chat with her class mates."
- "It has been good because when we use it at home it's either to do homework or use it."
- "Yes. She has gotten a lot of experience on the X/O."

A few noted, or implied, that the student was working harder than he/she might have been otherwise:

- "Yes, because I can see that now my child is learning more."
- "Yes. It has been an excellent experience for him, he actually types a full page of a story."
- "He has been doing work on it every day he brought it home."
- "Yes because I have seen her working hard."

A few mentioned the games and other software:

- "It was good to see my child playing the XO games already installed."
- "Yes, he knows how to play on the computer."
- "He enjoy the music software."

Not surprisingly, given the above responses, all but one answered yes to a question that asked whether they would advise the New York City Department of Education to supply XOs to all its students. More than half also said that they might be willing to contribute to the cost, although the question did not include any specific amounts:

Contribute to cost?

	Count
Definitely	3
Probably	9
Not sure	5
No	1
	18

Parent suggestions for changes to the XO

The parents had 18 suggestions for change, 11 of which focused on the Internet. Most of these responses seemed to assume that Internet access had come with the XO but somehow they had not been able to use take advantage of it. For instance, one wanted "to have more Internet," while another wanted the XO to "change the no Internet at home." Six wanted "faster Internet" or to change the "Internet connection speed." Two wanted fewer freezes, two wanted fewer websites blocked, two wanted more games, while one suggested that a phone line be added, one wanted the keyboard changed, and one wanted the machine to be lighter weight. In some cases, it seems likely that the student was dictating the responses, since the Internet was blocked at school but not at home.

Some of the parents' 17 suggestions for additions also echoed those the students had made, such as adding a touch screen (3), a pen (1), and a "small concealable printer" (1). Others were parental, such as adding passwords (2), adding access to homework help ("add a line were the kids can ask there teacher for help with homework"), and adding more "school activities" (2). And finally, a few related to the hardware, such as "different colors" (2), a bigger screen (1), a case (1), a "sim-card outlet" (1), a "big Internet connection" (1), and "a wireless card by a major carrier like Verizon"--this last was from a parent who had already had cable access and a wireless network at home. There was one suggestion regarding software, which was that "you can put the language to Spanish."

COMPARISONS WITH EXISTING SOLUTIONS

As schools consider whether to invest it XOs for their students, it is important to compare their cost effectiveness with such existing solutions as computer labs, laptops carts, and tablets, currently the most common ways to use computers in schools. However, comparing costs is difficult at this early stage in the deployment of the XOs, for at least several reasons:

- The XOs in this evaluation were part of a pilot. The students were well aware (and proud) of their special status, which may have led them to take special care and meant there was much less damage than might otherwise have been the case.
- Also because this was a pilot, the Teaching Matters staff put many additional hours into support at no cost. It is not yet clear how many hours would be necessary once the initial start-up issues are resolved.
- In theory, although not yet in practice, the XOs are used by students for many more hours each day than the school laptops.
- And last but certainly not least, it is very difficult to calculate comparative costs because they are covered by different budgets, administered by different people, at different levels of the system (school, Dept. of Education).

Nevertheless, in a first attempt at such a comparison, the evaluators visited two additional middle schools. One has replaced its computer lab with 500 tablets (400 for all the 8th-grade students and the rest for teachers) and the other has four laptop carts with 15 laptops each, plus a computer lab that is not used very often (because it has older machines, many of which are vandalized, because time there has to be scheduled, and because time is lost in moving there from the classroom). All students in the tablet school have tablets assigned to them individually,[4] but although the original plan was for the students to take them home, that has not happened because of logistical difficulties and the cost of insurance.

Some similarities and differences between Kappa IV (the XO pilot school) and the other two schools are already clear:

[4] The tablets were originally assigned to the 6th graders, who then took them on to 7th grade and now have them in 8th grade. According to the school's instructional technology coordinator, one unintended consequence of this phased deployment was that the 7th-grade teachers had all their students with tablets last year and really took advantage of this, but are now back to laptop carts and feel deprived. The 8th-grade teachers, on the other hand, are an older group and have been slower to integrate the tablets, with many feeling they are a distraction.

Similarities

- Although Kappa IV students complain that the XOs are slow, we heard similar complaints about both the laptops and tablets, most of which were several years old and judged (by the technology coordinators) to be severely underpowered. (This was also true of the laptops at Kappa IV.)
- Some of the speed problems in accessing the Internet had to do with the school's network, not the XOs. The Kappa IV school network can be problematic and is sometimes slow, but this was also the case at the laptop school and had been the case until recently at the tablet school.

Differences

- While the students at Kappa IV have been taught about the XO and used most of its features, students using the tablets were not and used only a one or two of its features (pen, swivel screen). Only one or two teachers were taking advantage of the "tablet" aspect of the tablets.
- The students in the laptop school have to share the laptops, since there are only 15 per cart. The tablets and the XOs are one-to-one, except that they are confined to one grade level in the tablet school and one class in the XO school.
- The teachers in the tablet school whose students had tablets last year but who have to use the laptop carts this year are not using them because of scheduling conflicts (too much demand, too few carts) and/or because it is "too much of a bother." The teachers in the laptop school also faced scheduling conflicts (as do the teachers at Kappa IV who want to use the laptop carts). This is by definition not an issue with the XOs.
- Despite the fact that the tablets are assigned to individual students, they are nevertheless subject to several different types of damage, only some of which are due to age and many of which (according to the technology coordinators) happen almost immediately. These include hard drive crashes, dead batteries, cracked cases, cracked screens, lost or damaged pens, loose hinges, and missing keys. Broken screens, missing keys, and dead batteries were the issues most commonly cited for the laptops at the laptop school. On the other hand, in four months, only one screen on the XO broke (due to being dropped) and only one keyboard was torn (but was still usable). Broken screens on the XO can be replaced locally, which is not the case for the laptops or tablets.

- The students using the tablets at the tablet school, which has no central server, had trouble saving and then finding their work. Although there was some use of thumb drives, time was lost during class when students had to search for a specific machine. This was not the case with the XO—and in fact was one reason the students at Kappa IV gave for liking the XO.

Repairs

The repairs for the tablets and laptops were almost all done in the schools by the technology coordinators, with supplies proved by the New York City Dept. of Education. At the tablet school, the technology coordinator had years of experience building and repairing PCs, which may not be a common occurrence. In addition, he is no longer required to send the machines out for repair but is allowed to do this himself. He reported that about 40 (8 percent) of the 500 machines in the school needed to be repaired last year, and 6 of these were damaged beyond repair. Although the machines have a five-year warranty, this does not cover most issues, such as screens cracking or batteries needing to be replaced, which are considered to be the result of "abuse." The technology coordinator felt that the students were less and less careful each year, but did not know if this was because the machines were getting old, the students were getting used to them, or the students were 8th graders. At the laptop school, about 10 of the 40 laptops (25%) needed to be repaired last year, with about 3 out of commission at any one point in time. As noted above, it is impossible to tell at this early date if the XOs will suffer similar damage, but at this early stage this does not seem to be the case.

SUMMARY AND RECOMMENDATIONS

In general, the XO pilot at Kappa IV has been a success from the point of view of all the participants, including Teaching Matters staff, teacher, students, and parents. The XOs low cost, portability, and quick learning curve, as well as the fact that it was easily accepted by both students and parents, make it a viable candidate for a genuine one-to-one computing solution--a computer that students can not only carry with them around the school but can carry home to use there as well.

However, the success of the pilot was undoubtedly due in large part to the specific conditions in which the XO was introduced at Kappa IV. Some of these conditions relate to the reasons that Kappa IV was chosen as a site for the pilot and others to the planning and support that went into its introduction and implementation:

(1) The school was selected not on the basis of its technology (which was not particularly good) or because it was a troubled school that laptops that would somehow benefit from an infusion of technology, but because it seemed to be a setting that would be conducive to a successful pilot. This meant that it had the following characteristics:

- It was a well-organized school with a strong leader who was supportive of the pilot.
- There was a positive school climate overall, and good cooperation among the teachers.
- There was an ongoing relationship between the school, its teachers, and the sponsor of the pilot (Teaching Matters).

(2) The planning that took place before the XOs were introduced and the support given during the implementation were crucial to the success of the pilot—especially since the XO itself is still being tested in urban environments. The planning and support included the following:

- The introduction of the XO was connected to clear educational goals, as well as to a specific curriculum that was supported by Teaching Matters.
- The curriculum fit into the teacher's curricular goals, was engaging for the students, and could be adapted to take advantage of the XO's capabilities.
- The teacher had ongoing, onsite support from a Teaching Matters professional developer.

- Additional Teaching Matters staff members were always available for technical support, both in the initial stages of the deployment when there were a number of highly technical issues that needed to be resolved in terms of connecting the XOs to the Department of Education network, and during implementation, when there was a need for some troubleshooting.
- Parents were brought in during the initial stages of the pilot, before the XOs were distributed to students, and were supportive of their children bringing the XOs home.

(3) In addition, the results may well have been affected by the fact that the pilot was small and because the students knew they had been chosen to test the XOs and felt special as a result. They also knew the pilot was being watched—by the school principal, by their teachers, by Teaching Matters staff, and by the evaluators.

While not all of these conditions need to be in place for every implementation of the XO, those considering their adoption should take a close look at the school leadership and climate, the educational goals that the XOs will support, the professional and technical support system, and the extent of parental engagement to make sure that they favor success—and if not, to do the preparatory work necessary to put them in place.

Finally, there are some small improvements that would facilitate the use of the XO in urban U.S. schools and homes:

(1) Load time: The students uniformly complained that the XO was slow. This translated into time lost accessing applications and getting onto the Internet. Although the students learned to live with this, they did not like it, and adults are likely to like it even less.

(2) Frequent freezes: The students also complained that the XO often froze. Again, they learned to live with this but nevertheless found it broke their concentration and broke into their work.

(3) Accessing the Internet: Most of the students did not have routers and wireless networks at home. Once they learned how, they found they could use the open

networks in their neighborhoods, but these were unreliable, often slow, and not available to everyone. The XOs have a USB Ethernet adapter but its costs an additional $30 and were not made available to the students in this pilot. It would significantly expand Internet access for those students whose families have cable or DSL modems at home if these were included with the XO purchase.

(4) Wireless networks: Both students and their families need to understand how wireless networks work. Some students (and we suspect some parents as well) apparently thought that simply wireless signals emanated from their desktop computers. A digital Help file might help them understand how the XO's networking capabilities work.

(5) The computer-to-computer sharing function was not reliable enough for the teacher to be able to build on its functionality—for instance, by having students read and edit each other's work—presumably because there were too many conflicting signals. Where possible, it would be advisable to set up a school server to act as a switchboard for all the XOs in the school.

(6) It is helpful for a teacher to be able to mirror, and model, his/her students' activities by adopting the XO as his/her machine. However, many teachers (including the teacher in this pilot) make extensive use of a projector in their teaching, and the XO did not work with the pilot school's projector. Having this facility would make it more likely that the XOs will be used by teachers and not confined to students.

APPENDICES

POST-IMPLEMENTATION SURVEY FOR STUDENTS

OLPC XO POST-IMPLEMENTATION SURVEY FOR STUDENTS

YOUR EXPERIENCE WITH THE XO

These questions ask about your experience with using the XO over the past few weeks.

1. What do you like BEST about the XO?

2. What DON'T you like about the XO?

3. Which of these have you used so far and where?

	At school	At home	Both	Not used
Browse (Internet browser)	◯	◯	◯	◯
Write	◯	◯	◯	◯
Chat (Instant Messaging)	◯	◯	◯	◯
Record (audio)	◯	◯	◯	◯
Record (camera)	◯	◯	◯	◯
Record (video)	◯	◯	◯	◯
Paint	◯	◯	◯	◯
TamTamjam (audio mixer)	◯	◯	◯	◯
TamTamEdit (audio editing)	◯	◯	◯	◯
TamTamSynthLab (audio mixing)	◯	◯	◯	◯
TamTamMini (audio editing)	◯	◯	◯	◯
Etoys (create your own "toys")	◯	◯	◯	◯
TurtleArt (painting/designing)	◯	◯	◯	◯
Pippy (python programming)	◯	◯	◯	◯
Calculate	◯	◯	◯	◯
Measure (graphing frequencies)	◯	◯	◯	◯
Memorize (memory game)	◯	◯	◯	◯
News Reader (RSS feed reader)	◯	◯	◯	◯
Acoustic Tape Measure (audio to measure distance between XO's)	◯	◯	◯	◯
Journal (main storage and activity application)	◯	◯	◯	◯
Log Viewer (log viewer)	◯	◯	◯	◯
Analyze (wifi utility)	◯	◯	◯	◯
Terminal (linux prompt for admin)	◯	◯	◯	◯

OLPC XO POST-IMPLEMENTATION SURVEY FOR STUDENTS

4. Are there any functions that you have not used much or at all but would like to? If so, list them here:

5. Did you work with other students by using the "share" function on the laptop for any of these?

	Yes	No	Not sure
Chat (Instant Messaging)	◯	◯	◯
Browse (Internet browser)	◯	◯	◯
Write	◯	◯	◯
Record (audio)	◯	◯	◯
Record (camera)	◯	◯	◯
Record (video)	◯	◯	◯
Paint	◯	◯	◯
TamTamjam (audio mixer)	◯	◯	◯
TamTamEdit (audio editing)	◯	◯	◯
TamTamSynthLab (audio mixing)	◯	◯	◯
TamTamMini (audio editing)	◯	◯	◯
Etoys (create your own "toys")	◯	◯	◯
TurtleArt (painting/designing)	◯	◯	◯
Pippy (python programming)	◯	◯	◯
Calculate	◯	◯	◯
Measure (graphing frequencies)	◯	◯	◯
Memorize (memory game)	◯	◯	◯
News Reader (RSS feed reader)	◯	◯	◯
Acoustic Tape Measure (audio to measure distance between XO's)	◯	◯	◯

6. Where do you charge the XO? (Check ALL the places you charge the XO)

- ☐ At school in my homeroom
- ☐ At school in my Literacy class
- ☐ At home

Other (please specify):

7. Have you had any problems with the XO?

- ◯ Yes
- ◯ No

OLPC XO POST-IMPLEMENTATION SURVEY FOR STUDENTS

8. If you had problems, what were they?

9. If you had problems, how did you solve them? Who helped?

THE XO AT SCHOOL

These questions ask about your use of the XO at school.

1. What was the best thing about having the XO at school?

2. What don't you like about having the XO at school?

3. List the classes that you have used the XO in:

4. What did you use it for in these classes? (For example, writing, calculating, chatting)

5. What else have you used the XO for at school?

6. Where do you keep the XO during the school day?

THE XO AT HOME

These questions ask about your use of the XO at home.

OLPC XO POST-IMPLEMENTATION SURVEY FOR STUDENTS

1. What is the best thing about having the XO at home?

2. What don't you like about having the XO at home?

3. About how often do you take the XO home?

- ◯ Every day
- ◯ Almost every day
- ◯ Every few days
- ◯ About once a week
- ◯ Less than once a week

4. Do you feel safe carrying the XO to and from school? If not, why not?

5. About how often do you use the XO at home?

- ◯ Every day
- ◯ Almost every day
- ◯ Every few days
- ◯ About once a week
- ◯ Less than once a week

6. Can you get the XO on the Internet at home?

- ◯ Yes
- ◯ No

7. Did you ever use the XO for the Internet at the public library?

- ◯ Yes
- ◯ No

OLPC XO POST-IMPLEMENTATION SURVEY FOR STUDENTS

8. Has anyone else used the XO at home? (Check everyone who has used it)

- ☐ My father
- ☐ My mother
- ☐ My brother(s)or sister(s)
- ☐ My grandmother
- ☐ My grandfather

Anyone else?

9. Do you have another computer at home that you use? (You can check more than one choice)

- ☐ Yes, my own
- ☐ Yes, one I share
- ☐ No, not right now

If you share the other computer, who do you share it with?

10. If there is another computer at home, did you use the XO... (check one)

- ◯ IN PLACE OF the other computer
- ◯ IN ADDITION TO the other computer

11. Have you used the XO anywhere else aside from school and home? If so, where?

THE NEXT XO!

If you were advising the company that designed the XO, what would you suggest be changed or added to make the XO more useful for student and more fun?

1. This is what I would like CHANGED:

1.
2.
3.

2. This is what I would like ADDED:

1.
2.
3.

OLPC PRE-IMPLEMENTATION SURVEY FOR PARENTS

Current Computer Access

We have devised these questions so that we can answer technology related issues that may come up with the XO computers at home.

Personal Information

First and Last Name: _____

Address (include zip code): _____

Telephone number: _____

How many people live in your home (including yourself)?

- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ more than 5

Do you currently have a computer at home?

- ○ Not currently
- ○ Yes, 1 computer
- ○ Yes, 2 computers
- ○ Yes, more than 2 computers

If you currently own a computer, please provide the following information. If there is more than one computer in the home, please provide this information for the computer used most by your child:

	Type	Make	Purchase date	Where is it?	Internet access?	Wireless Network?
Home Computer						

Who repairs the computer when you have a problem?

_____

How often does your child use the computer at home?

- ○ more than 2 hours a day
- ○ 1 to 2 hours a day
- ○ less than 1 hour a day
- ○ once every few days
- ○ once a week or less

OLPC PRE-IMPLEMENTATION SURVEY FOR PARENTS

Are you planning to purchase a computer in the near future?

- ◯ Yes
- ◯ No

When your child brings the XO computer home, will s/he be able to access the Internet?

- ◯ No
- ◯ Yes

If so, how?

POST-IMPLEMENTATION SURVEY FOR PARENTS

OLPC Post-Implementation Survey for Parents

1. Default Section

Your name

Name of your child

Has it been a good thing for your child to bring the XO home? If so, what has been good about it?

Have there been any problems with having the XO at home? If so, what are they?

Do you have any concerns about the safety of bringing the XO home? If so, what are they? Do you still have them?

Did you have any other concerns? If so, what were they? Do you still have them?

About how often has your child been using the XO at home?

- ○ Every day
- ○ Every few days
- ○ About once a week
- ○ Less than once a week

Does anyone else use the XO other than your sixth grader? If so, who uses it and for what?

If you have another computer at home, does your child use the XO...

- ○ INSTEAD OF the other computer
- ○ IN ADDITION TO the other computer

Would you advise the NYC Dept. of Education to supply XOs to all students?

- ○ Yes
- ○ No

OLPC Post-Implementation Survey for Parents

Would you be willing to contribute to the cost of this?

- ◯ Definitely
- ◯ Probably
- ◯ Not sure
- ◯ No

If you were advising the company that designed the XO, what would you suggest be changed or added to make the XO more useful for students or for others in your family?

Changed? (1) _____

Changed? (2) _____

Added? (1) _____

Added? (2) _____

LOGIC MODEL

TEACHING MATTER'S OLPC PROJECT AT KAPPA IV--SIMPLIFIED LOGIC MODEL				
Research plan: Implementation in one 6th-grade classroom at Kappa IV. Two comparison schools (one 1:1 laptop school and one laptop cart school) for TCO substudy.				
Area	**Objectives**	**Indicators of success**	**Data sources**	**Questions to be addressed**
School Environment	XOs are economically viable in a NYC public school environment (Total Cost of Ownership-TCO)	No hardware repairs in need of adult (teacher/TMI) intervention	Log of support requests; review of blog, teacher survey (OLPC and comparison schools); computer coordinator survey (OLPC and comparison schools)	What are the main hardware, software, and OS issues?
	Xos are logistically viable in a NYC public school environment	No OS repairs in need of adult (teacher/TMI) intervention		How frequently is the hardware, software, or OS in need of repair requiring adult intervention?
		No software repairs in need of adult (teacher/TMI) intervention		How long do repairs generally take? What are the associated costs? Who does the fixing?
Students	XOs will be usable by students	Students take laptops home	Student focus groups; student survey; teacher survey	Do students prefer XO over traditional PC/Mac laptops?
		Students bring laptops back		What do students do to personalize the laptop?
		Students do not request to use PC/Mac laptops instead of Xos		Do students "own" the problems and develop strategies to resolve them?
		Students personalize laptops		Where do students go to resolve laptop issues?
		Students continue to personalize laptops		Do students continue to use the XO once initial novelty has worn off?
		Students are able to repair laptop problems without adult		
Teachers	XOs will be usable by teachers	Teacher feels managing XOs in classroom does not interfere with teaching and learning	Teacher interview; teacher survey; student survey	Are XOs sufficiently transparent tools in the classroom?
		Teacher feels managing XOs in classroom benefits teaching and learning		Do teachers continue to use the XO once initial novelty has worn off?
		Teacher continues to use laptops throughout TMI curriculum		Are teachers willing to work through any initial XO learning curve?
		Other teachers (non-TMI classroom) incorporate XOs in their classes		Are other teachers receptive to XO use in their classrooms?
TMI curriculum	XOs are effective for learning objectives of TMI writing curriculum	Students use the XO throughout entire TMI curriculum	Teacher survey; student survey; parent survey	Do students find the XO helpful in completing the entire TMI curriculum?
		Students use the XO at home regularly (to be defined) to work on TMI curriculum assignments		
Beyond TMI curriculum	XOs are used for additional purposes beyond TMI curriculum	Students use the XO at home regularly (to be defined) for their own purposes	Teacher survey; teacher interview; student focus groups; student survey; parent survey	Who uses the XO at home? Is it shared with siblings? Where is it kept at home? How often is it used? For what purposes?
		Students use the XO in other classes		Are there parental restrictions at home limiting use? What are parental attitudes toward XO and (nternet use?
		Teachers allow students to use XO in other classes		Do students feel safe carrying the XO around?
		Students carry XO around school		Did students previously have computer access (own or shared)? Did students previously have Internet and/or computer access? Does access increase as a result of having laptops at home?
		Students use XO unprompted at school (and continue to do so)		Are parents concrned about saftey issues (ie., being online, carrying laptop to/from school, etc)?