Moving Towards Learning with One-to-One Laptop: A Longitudinal Case Study on Tools, People, and Institutions

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Abstract: The purpose of this study is to investigate how new learning possibilities could take place in environments where students are saturated with laptops. Specifically, this work draws upon in situ examples collected from three schools in Thailand over a one year period to highlight how the schools are evolving using a theoretical framework that treats change as a developmental process.

Overview

This paper is a result of Thailand's first longitudinal study of learning with one-to-one laptop. We offer an analysis of the case studies based on a theoretical framework offered by Papert and his colleagues. When looking at how schools are embracing or resisting change, Papert sees the process as developmental. That is, change itself is a learning process (Papert, 1997; Cavallo, 2004). Comparing this process to Piaget's notion of assimilation and accommodation, Papert suggests that it is normal for schools to initially resist innovation by assimilating the change into the exiting school structure (Papert, 2002). Resistance is essential for the eventual shift to a completely different way of thinking (accommodation). Thus, it is not so important whether or not a particular school is doing things "right" or "wrong". What really matters is that the school keeps moving forward in the development of their thinking.

The three schools involved in this work have used XO-1 laptops from the One Laptop per Child (OLPC) non-profit association for the entire duration of this study. The focus of this paper is, however, to present an analysis of learning opportunities with one-to-one computing and not on the particular benefits or drawbacks of the XO machine offered by OLPC. The intention is to put the spot light on the people and the institutional factors that play a significant role in the fate of one-to-one laptop programs regardless of the hardware choices.

The Pilot Schools

There were three schools involved in this work. The first site, Ban Samkha, is a small rural school while the later two sites, Ban Sankhumpang and Tessaban-4, are large urban schools. Ban Samkha school has twenty eight students and everyone have received a laptop. Ban Sankhumpang has received three hundred machines and they have been given to primary students from grads one to six. Tessaban-4 has experimented with one-to-one computing in two classes. They have forty seven laptops.

This work follows the development of learning activities from the participating schools over the course of one year, starting in August 2008. The data collected for this work was gathered from three main sources: my own observation from site visits, interview sessions with teachers and students, and written documents from student journals and teachers' monthly reports.

Case Studies

Household Accounting

In the late 1990s, Ban Samkha was suffering from debt problems and villagers who cannot manage their finances were losing their homes. The village responded by creating a local debt-relief fund for those in trouble. There was a condition that those who which to receive help must build up a good financial habit by keeping a log of their income and expenses. Given that many villagers were illiterate, their children became helpful in keeping the account book up to date (see Figure 1 left). This activity unsurprisingly led to the idea of using a computer spreadsheet. Since the students were allowed to take the laptops home, the spreadsheet idea really worked (Figure 1 right). Khru Srinuan, a teacher at the school, described that the parents immediately became interested in the idea. Being able to utilize the technology at home made the activity much more personal and lowered the existing metal barrier towards technology.

The Laptop Band

This activity involved students forming a band mixing the laptops with traditional Thai music instruments. The idea emerged after a group of students became fascinated using the laptop to create music. A parent who is a vocalist from a traditional Thai band saw what the students were doing and engaged them to sing along. The group then came up with an idea that the laptops can serve as instruments in the village's band. This band (see Figure 3) became extremely popular and they performed at many shows including a few in Bangkok.

Because the laptop band became rather popular, the two other schools in this pilot program took on the idea and created their own version of the band. However, these later bands were different. The activity was adapted from its original context of a small rural school to an urban setting with a much larger class size. The activity was not a failure. In fact, feedback from students and teachers were highly positive. But the quality and authenticity of the activity were different from Ban Samkha. The differences observed of the same activity in different schools show how learning is tightly coupled to the local context at which it takes place. Such learning activities do not transfer easily.

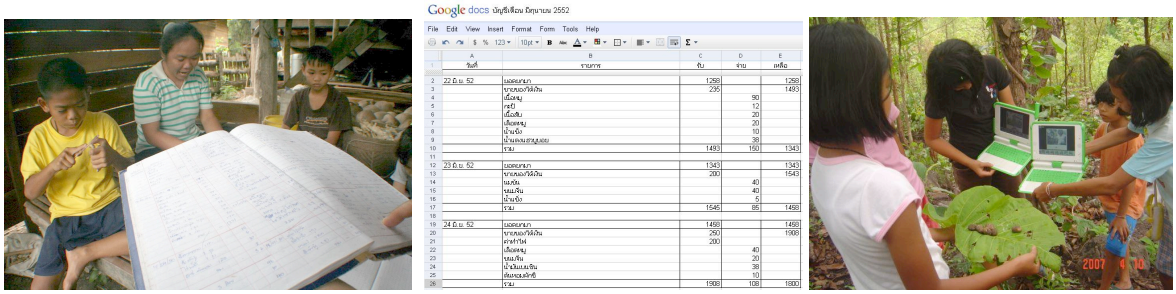

Figure 1. (Left) An account book logged by students. (Center) Example of an account book created in Google Docs. (Right) Students taking pictures with the laptop's built-in webcam.

Rich Media and Storytelling

Many teachers were able to utilize the fact that most students love the laptop's built-in camera to develop novel learning activities. For example, Khru Srinuan in Ban Samkha School organized a photography fieldtrip along the nearby mountain. The assignment was for the students to take pictures of plants or flowers that they do not recognize in the forest as shown in Figure 1 (right). They would then show the pictures to their friends and try to figure out what the plants are and write descriptions for others to later see. Other observed examples include video assays showing indigenous medicine using captured video interviews, stage acting using the computer screen for props and making sound effects, and making animated electronic cards for teachers and friends during the New Year's celebration.

Innovation as a Developmental Process

Despite the described case studies of how one-to-one laptop can open up new learning opportunities, it has been clear to the researcher that the schools' primary responsibility is to deliver the content defined in the national curriculum. Any intervention or innovation must first address how this ultimate responsibility can still be fulfilled. Curriculum mapping has been the most commonly used technique to deal with this issue. Teachers would evaluate students' projects and map what was learned to items in the curriculum. This method satisfied the school system while giving room for project-based activities. It is important to note that teachers do not see this as a compromise. Instead, they usually promote this practice as a standard procedure

We believe this situation is an example of how assimilation is taking place in the schools. Curriculum mapping is a good example of how the new is assimilated into the old without requiring a major change to the system's foundation. However, this is a kind of assimilation less severe than many other cases where the innovation is transformed entirely to keep every aspect of the traditional schooling the same. The schools have changed in many ways (i.e. long-term projects are possible), but some key aspects of traditional schooling are still kept the same. Thus, from a Papert's perspective, these schools are well in their developmental stages. It is essential, though, that they continue to evolve. Otherwise there is a danger of becoming too comfortable with the current practices that they may become stuck in an artificial stable state. For example, even though curriculum-mapping allows for project-based activities, project ideas often stem from the need to cover a certain topic in the curriculum more than the students' interests. All parties involved must work together to keep pushing things forward in a positive direction.

References

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