

Classroom Presenter on XO Project Report

Abstract

The OLPC XO-1 Laptop is presently being distributed to classrooms around the world; however, there are still relatively few classroom-based software applications available for it. The Classroom Presenter for the XO project's goal is to enable teachers to more easily integrate the XO laptop into their existing curricula. Based on UW Classroom Presenter, it allows a teacher to distribute an interactive presentation (deck of slides or other visual materials) to an entire classroom. XO Classroom Presenter is implemented as an "activity" on the XO laptop and it integrates with the operating system and other installed activities. The collaborative features are supported by the XO's Sugar operating system.

(Evaluation & Conclusions)

Introduction

The non-profit One Laptop Per Child (OLPC) foundation and the XO laptop project were created in 2005. The XO laptops were designed as a tool to educate underprivileged children worldwide, with the goal of providing "one laptop per child". In 2007, over 500,000 laptops have been distributed to various countries.

Although XO laptops are making their way to children and educators, software development is in an early stage. As a result, the available applications (known as "activities") for the XO are limited, and few of these activities are suited for teacher-driven instruction, such as in a classroom. The XO has several activities that employ collaborative features for student-centric, constructivist learning, but these activities lack the ability to allow collaboration and interaction while still allowing a teacher to present materials. Furthermore, these activities do not easily integrate into existing curricula, meaning teachers willing to use the XO in a classroom must redesign their lesson plans.

To address this need, we are developing the Classroom Presenter for the XO (CPXO) activity. CPXO is an XO activity designed to distribute and collect information in a classroom setting with several XO laptops. An instructor uses CPXO to load a presentation in the form of a slideshow. The instructor then distributes the presentation to each student's XO in the classroom. Each student follows the presentation, and can add individual notes and annotations, called "ink". The ink can be submitted back to the teacher, who can review the submissions and select a few to redistribute to the entire class. Teachers can use existing slide decks (such as a PowerPoint presentation), use photos or images of a hand-written lesson plan, or create a new slide deck using built-in tools. Therefore, CPXO provides a framework for teachers to present an existing lesson plan to a classroom of students, and allow the students to contribute and engage in the presentation.

Related Work

There have been related efforts to implement collaborative presentations or activities in a the classroom environment. The original Classroom Presenter [cite] is a Tablet-PC based interactive application that we have used as a guide in developing our application. In Classroom Presenter, the instructor and the students interact as they work their way through a shared presentation. Classroom Presenter is a robust application, but is limited to machines that are capable of running Windows XP or Vista.

Another related project at the UW is attempting to implement Classroom Presenter on lower-power platforms. [cite]. The goal of the project is to have the application work on hardware environments such as the Nintendo DS [cite].

The One Laptop Per Child project aims “To provide children around the world with new opportunities to explore, experiment and express themselves.” [cite] While there are currently numerous Activities for children and teachers to use on this unique piece of hardware, there is a shortage of teaching tools for a classroom filled with these machines.

- [UW Classroom Presenter](#) – Richard Anderson, et al., UW CSE
- UW Classroom Presenter on other lower-power platforms, such as the Nintendo DS – Craig Prince, UW CSE
- [One Laptop Per Child](#)
- [XO Image Quiz activity](#) – via OLPC wiki
- [Multiple Mice for Computers in Education in Developing Countries](#) – Pawar, Pal & Toyama, Berkeley

Approach

- Develop an adaptation of UW Classroom Presenter that works on the XO
 - Not a straight port, because some UW Classroom Presenter features don't make sense on the XO, and the XO may benefit from things not part of UW Classroom Presenter
 - Possibly place more emphasis on allowing students to take control than exists in UW Classroom Presenter
- Focus on distribution and presentation of content; content can be created on a desktop PC where more power and tools are available
 - At the same time, limited content creation may be useful on the XO laptops; this would allow students to make/share slides as well as view them

Implementation

UW Classroom Presenter allows for the teacher to present submissions on a projector or other remote visual media device. The XO laptops, however, do not have this capability, and we do not expect classrooms in underprivileged communities to have access to these resources. Therefore, we decided that instead of projecting student submissions on a remote media device, we would redistribute submissions to the student XOs.

Additionally, ink is fundamentally different from UW Classroom Presenter, because the XO is not a tablet PC. Using a tablet PC, ink is drawn by using the stylus, however on the XO, ink is drawn using a touch-pad mouse. In CPXO, we provide several basic drawing tools to assist with drawing shapes and writing text. In addition, we include a separate text entry field that is separate from the drawing panel. The OLPC developers plan to provide support for using a stylus with the XO, which would greatly benefit the CPXO activity. However at this time, there is no support and no available drivers for the track-pad on the XO laptop.

Evaluation

Throughout our evaluation, we will continually be addressing the following questions.

- Is the application full-featured and complete? Does it meet the needs of teachers/students/its users?
- Is the application user-friendly and easy to use? Are teachers and students both able to figure out how to use it without extensive documentation? Does it integrate well with the rest of the Sugar environment?
- Is the application scalable? Does it work reasonably with anywhere from a few XOs to an entire classroom-full?
- Is the application robust? Does it handle problems in a reasonable manner?
- Does the application enable learning? What is the educational value of the application?

To address these questions, we will adopt three testing strategies to evaluate our project: a usability testing, performance testing, and a live demonstration. While a true evaluation will require more time and application mileage, we will use these tests as early indicators of success.

The CPXO activity is strongly user-oriented, so a standardized usability test is needed to simultaneously test for software bugs, completeness of features, and ease of use. The test is composed of a set of explicit instructions to perform in the CPXO activity designed to generate meaningful output. We then be compared the output against a set of results and perform a qualitative analysis of any discrepancies or deficiencies. The usability test is performed both by our team for debugging purposes and by sample users for an assessment of the usability of the activity. Initial usability testing is done with a small number of XO laptops, while usability testing by users is done with several XO laptops as would be in a classroom.

To measure the performance of the CPXO activity, we take quantitative measurements to compare with other systems. The measurements are durations of time required to perform certain tasks, such as file sharing, slide navigation, activity initialization, ink drawing, and submission times. For functions that are common to XO activities such as activity initialization and file sharing, we will compare our measurements with measurements from other XO activities. For functions unique to Classroom Presenter such as slide navigation and submission times, we will qualitatively assess the measurements and compare these times to what would be expected in a classroom. All functions are compared against UW Classroom Presenter. Performance testing is designed for a classroom setting with several XO laptops.

A live demonstration will be performed on May 21, 2008, at Arbor Heights Elementary School in Seattle, Washington. The demonstration will take place in a classroom of 25 third-grade children, who will have 8 XO laptops, with which the children are already familiar. The demonstration will qualitatively assess the usability, performance, and educational value of the CPXO activity. We will rely on the teacher and student's feedback to measure educational value.

Throughout our evaluation, we will continually be addressing the following questions.

- Is the application full-featured and complete? Does it meet the needs of teachers/students/its users?
- Is the application user-friendly and easy to use? Are teachers and students both able to figure out how to use it without extensive documentation? Does it integrate well with the rest of the Sugar environment?
- Is the application scalable? Does it work reasonably with anywhere from a few XOs to an entire classroom-full?
- Is the application robust? Does it handle problems in a reasonable manner?

Societal Implications

- Similar to societal implications of XO laptop itself

Conclusion and Future Work

- Possibility of continuing to work on project after graduation

Acknowledgments

References

Software API References

- [Cairo Graphics Tutorial](#)
- [Telepathy Documentation](#)
- [OLPC Wiki](#) - various articles throughout
- Python tutorial
- Source code for Sugar on the XO laptop