Project Geo-Cache: Reaching Children with Structured Content and Multi-Tiered Repositories

Anthony DePrato, February 2011

I have fully tested this concept, and it works . All it needs is a push in the right direction.~ Tony DePrato

In the last ten years I have seen numerous education plans designed to reach underprivileged children. Some are monumentally complex, such as the OLPC-One laptop Per Child- from MIT. Others are very trendy and developed with pop-culture such as Edmodo, the secure and free online course-ware and collaborative network.

All of them miss the mark on what it takes to turn a technology reinforced situation into an actual educational opportunity. The secret to success in any educational initiative is CONTENT. Without content created by educators a curriculum cannot be delivered. Students cannot be expected to develop solely on their abilities to stumble upon online resources. Standards cannot be set, if the content students are exposed to is random and untraceable. Without good quality CONTENT, technology becomes novel and often just a distraction.

Even though instructional designers have been delivering video and multimedia for more than 20 years, the end-user had to be expensively equipped to receive the material and interact with it. Today the hardware is not only cheap, but it is becoming supported by open-source software such as Ubuntu and Android. This means we need not argue over what kind of equipment should be used to help reach children in areas where poverty is more common than electricity.

Focus needs to be shifted to the creation and licensing of content, and the processes used to get this content into geographically significant locations, so that multiple low cost devices can access it.

This project would work in four phases.

Phase 1: Parent repository and child repository creation.

Phase 2: Content procurement and license development.

Phase 3: Remote repository planning and implementation.

Phase 4: Device selection and distribution.

Phase 1 - Parent Repository and Child Repository creation.

A repository, in reference to the Geo-Cache Project, is a collection of severs that holds vetted content. This content can be originally created, virtualized, or cached from other websites for redistribution.

Most of the characteristics of a repository are fairly straight forward, but virtualization needs to be clarified. Let us assume that a school wish to donate a collection of K-5 learning software that is CD based and was purchased to use on the legacy Windows 98 Operating System. Now, also

assume that a group school children in an impoverished area have a school and donated computers or devices, with Internet access. However, these students are using devices like the OLPC which does not come with any Windows Operating System. By creating a VIRTUALIZED Windows 98 System on a server we can host the older content on the Internet, and children can connect to it, and use the software which would normally not work on their equipment. Pretty cool I think.

In phase one two types of repositories are mentioned- Parent and Child. The parent repositories would be few in number. They would all have the same content, and be located in a handful of data-centers around the globe. The child repositories would be connected to the parents, and the administrators of the child repositories would choose which materials need to be copied for their geographical area.

For example, there would be a parent repository in the United Arab Emirates. In each Emirate the local government would create a child repository, and then copy the items they need to support various curricula in their emirate.

This material might need to be manually installed in smaller regional repositories that are nothing more than a few old servers powered by solar panels and a generator. However, because curricula sustain standards for 3-5 years, these manual installations could easily be managed, and would not require the remote area to have direct Internet access. Nor would anyone have to maintain an expensive data-center. It would be easy to consistently use older donated servers, tower cpus, or even laptops to keep remote repositories alive.

Although this idea is actually very easy to implement, it is for not without content and licensing.

Phase 2 - Content procurement and license development.

Many schools around the world have old computer-based learning materials that they no longer use. These need to be collected through and "old software re-cycling initiative". Collecting the software by mail, or via the Internet is not difficult. The difficult part is getting the original publisher to agree to release the software for use within the scope of the Geo-Cache Project.

Next major publishing companies need to be approached for donations of e-books and other materials that can be transferred to the project. Many companies also have legacy materials, which have a great deal of value, and were abandoned due to aesthetic concerns.

While schools and companies were being lobbied, educators world-wide would be asked to start participating in content creation. The idea is to acquire multimedia and documents that meet posted curriculum requirements. Multiple curricula can be created for different areas of the globe, and educators can choose where they want to contribute. They would be able to contribute audio, video, and document based content. If they had programming aptitude they could also create interactive multimedia and SCORM packages.

Existing public resources, such as Youtube, need to be brought into the plan. They need to add an "opt-into Geo-Cache Project" to their upload areas. This way Authors can choose to make their media legally cache-able by the Geo-Caching project.

Many videos and training materials are currently publicly accessible. However, to keep them legal the creators have to be contacted and asked to opt-in for the project. This would need to be done with volunteers and grass-root efforts from within schools around the world. Schools running programs such as IB ITGS would be prefect candidates to participate annually with the Geo-Caching Project.

Without enough content to create a curriculum that is independent of a full-time on-site educator we cannot hope to distribute quality education. Devices and hardware eventually fail no matter how clever they might be. Good content can be kept alive and distributable for decades, and it will take decades to reverse decades of poverty and short-falls in education.

Phase 3: Remote repository planning and implementation.

After the top repository structure is created and content is acquired, the next step is setting-up the smaller regional repositories. These can be built with older equipment as previously mentioned. The only additional requirement is that each one be extended with Wifi, or hopefully WiMax, technology.

For example, a village could have a repository that is structured to hold content for grades K-6. Once the content was delivered, the students would access it using WiFi. WiFi equipment is often discarded because a new standard of speed or coverage is perceived as necessary by those who are classified in the IT industry as "early-adopters". This means there is a huge supply of working WiFi equipment that ends-up in landfills or in storage closets. To keep the cost of smaller remote repositories down, an effort would need to be made to collect WiFi equipment for the Geo-Caching project.

From personal experience, I have decommissioned 30 WiFi access points in less than a weeks time when a new lot was sent to my school from our head office. I made sure these were sent to schools who needed them, but the paperwork required to shift equipment is often more tedious than the paperwork required to trash equipment. I am sure other organizations have a similar struggle with asset management. The leadership of the Geo-Caching Project must strive to create relationships with companies and schools so that the flow of viable and needed resources is not impeded by extensive red-tape.

Because Phase 1 included the creation of fairly large and regionally managed child repositories, the logistics of determining the smaller remote locations would fall under the authority of regional educators who should know which areas have the least access to educational content.

Phase 4: Device selection and distribution.

A device needed to work with a repository system such as this would to meet these requirements:

1. Wifi or 3G enables.
2. Can view PDF files.
3. Can interact with HTML and HTML5 content.
4. Can play Java or Flash content, if not both.
5. Is fast enough to access Google Docs or a similar platform.
6. Has a rich text editor built-in.
7. Has a calculator built-in.
8. Has a battery life of at least 8 hours.
9. Has an extra bright screen. LED is recommended.
10. Would be able to be cleaned or wiped down easily without extreme sensitivity to moisture.
11. Would include a standard mini-headphone jack.
12. Would include a standard integrated microphone.
13. Can be powered with an alternative power source either directly or through a charging station.
14. Battery and storage system can be serviced in the field by a technician.

15. OS supports multiple language menu options.

If you check the market today you will find many low-cost devices that meet most of these standards. The alternative power supply issue is one many people are tackling, and if they had a sizable project to develop for, I firmly believe low cost solutions would be a reality in a short period of time. The OLPC project has both a hand-crank and foot-pump that can kinetically charge the unit, I am sure a charging station that can charge many small units is a possibility.

I mentioned using an open-source OS, but this is not always the best method. If funds can be used to buy low-cost Windows or OS X computers or devices, then these will work as well. The key is not to get caught-up on brands or operating system preferences. If a device meets the standards, then the device can be used. Mixing multiple devices into a single educational environment is not only becoming common, it is becoming the preference for many students and schools alike.

An evolving model in 2011 is when schools use their resources to maintain a flexible and well resourced infrastructure, and students follow the technology standards to choose a device that both meets the standards but also appeals to them as a user.

Project Geo-Caching Summary

Technology in all of its wonder cannot single-handedly solve the problems of poverty and education within an impoverished environment. Children will still need other resources to learn with and express themselves. Considering though that we can capture thousands of hours of professional knowledge in multiple languages for multiple curricula, it would be a dis-service to those in need not to try.

Using a repository based system to cache and distribute vetted content is not only economically viable, but it is easy to maintain and is culturally driven and regualted. The heart of the project lies in the educators who contribute content through their daily practice and the regional repository managers who make sure that content gets to those in need.