Taking It to the Street:
Using QR Codes to Tell Student-Created (Hi)stories on Location

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One of the challenges that social studies educators face daily is how to make student learning relevant. Digital technologies can play an important role by connecting what happens in the classroom to the world beyond. It is important, however, that such a link not be limited to gleaning information from Internet searches, where students are merely consumers of information. Instead, digital technologies should be integrated in ways that provide students with learning experiences that go beyond what can be done without technology.[1] One way to do this is by turning students into producers of information and having them create content rather than simply consume. This article describes an initiative in which teachers and students used a variety of digital tools to research local history and create digital stories accessible at their relevant location by way of QR codes.

in advertising or on product packaging, QR codes are ideal tools for education, as they can be used to enhance learning inside and outside of the classroom by amplifying physical resources with digital ones.[2]

For example, in the social studies, QR codes can be used to make maps, timelines, displays, and even physical locations interactive by linking them to websites or multimedia with questions or clues related to various learning activities. They can also be used to scaffold learning by connecting students to additional information, hints that might help them solve problems, or video tutorials. The beauty of QR codes is that they can be used to give students access to targeted content without having to spend a lot of time searching for information; obviously, such content can include teacher or student-created materials.

Photo by Mark van 't Hooft

Students from Walls Elementary School in Kent, Ohio, aggregate their research findings on a wiki page. March 2011.

QR Codes
QR, or quick response, codes are small squares made up of black and white pixels that function much like the more traditional bar codes. The main difference is that due to their design, QR codes can hold much more information than bar codes.

QR codes can be scanned by smartphones or other wireless mobile devices to access a variety of digital content (see sidebar on p. 101). Examples of embedded content include text, map coordinates, and hyperlinks to websites or multimedia content such as videos and podcasts. While they are mostly used

The GeoHistorian Project
The GeoHistorian Project (**www.rcet.org/geohistorian**) is the result of a collaborative effort between Kent State University's Research Center for Educational Technology, the Kent Historical Society, and five teachers from the Kent City Schools.[3] Participating

teachers and students in Kent, Ohio, worked with their local historical society and community members at various historical sites to research Kent's local history and create digital short stories.

The core of the GeoHistorian Project is its curriculum, which is available for free at **www.rcet.org/geohistorian/curriculum/** and includes all support materials as well as a list of items to consider before implementation. The unit is divided into four segments and its content is linked to standards from the National Council for the Social Studies, National Council of Teachers of English/International Reading Association, and International Society for Technology in Education.[4] Throughout the unit, students utilize a variety of readily available, off-the-shelf digital tools while learning about local history, what it means to be a historian, and digital storytelling.

1. Introduction to Digital Storytelling
Following a brief introduction to the entire unit, including a QR code demonstration, students learn about digital storytelling by viewing and assessing sample digital stories, using a rubric as guidance. Next, they get hands-on practice by creating brief histories about their own lives, which they share with classmates for review. These preliminary activities serve several purposes. First, they help students develop an understanding of what a good digital story looks and sounds like with regards to both content and design. Second, these activities encourage students to think historically. Third, students become familiar with some of the digital tools they will use throughout the unit, including digital cameras, scanners, and digital story creation software such as Microsoft's PhotoStory.

2. Historical Research
The content of the GeoHistorian curriculum focuses on local history. In small groups, students research the history of sites of local importance. Research includes Internet searches, a visit to the local historical society, and on-site

Photo by Mark van 't Hooft

Students, teachers, and parents approach the historical Marvin Kent House in Kent, Ohio, for a tour. May 2011.

analysis of the locations under study (with, in some cases, interaction with current owners). Each group aggregates its research on a wiki page in preparation for the storyboarding and script writing phase.

During this segment of the unit, students also learn about skills that historians have to develop to successfully do their work. For example, they learn how to properly analyze photographs, documents, and artifacts, as well as how to corroborate information from multiple sources. Students are expected to apply these skills while doing their own research. Time permitting, student groups also share their findings with their classmates.

3. Storyboarding and Script Writing
Once the research has been completed, students organize their findings. They do so by creating storyboards and scripts (using Word or PowerPoint templates) that will form the basis of their digital stories. Students spend their time brainstorming, organizing, writing, peer editing, and revising storyboards and scripts. Again, the final products are shared with classmates to receive feedback. In addition, the storyboards and scripts are carefully reviewed by the staff of the local historical society to ensure that they are historically accurate. At this point in the unit, a short break can be built in to provide ample time for this review.

4. Creating Historical Digital Stories
The final step is to turn the storyboards into digital stories. Students use digital storytelling software to create a timeline of pictures, record the narrative, and add finishing touches such as titles and credits. A checklist guides each group to ensure a quality end product. Again, the local historical society performs a final check for accuracy. After the digital stories have been rendered, they are uploaded to a web server or media-sharing site such as YouTube. The URL (Internet address) associated with each video is then used to create the QR codes. Once the QR codes have been tested, they can then be installed at their respective sites (e.g. on permanent plaques), or be used to create walking tours or brochures.

Curriculum Implementation and Lessons Learned
Originally designed as a four-week unit for middle and high school students, we implemented the GeoHistorian curriculum with two groups of fifth grade students during the 2010–2011 and 2011–2012 school years. Following each implementation, the necessary adjustments were made to the curriculum. For one, we found that while the unit covers a substantial amount of content and skills, it was also characterized by its flexibility. For example, if students were already familiar with digital storytelling, most of the first week's content could be skipped. In contrast, if more time was needed for certain activities, such as familiarizing students with the technologies used, the unit could easily be spread out over a period longer than four weeks.

Another lesson we learned from the trial implementations was the importance of preparation. As a result, we created a set of instructions that should be consulted well in advance of implementation of the GeoHistorian curriculum. The instructions include a list of materials and tools that should be gathered before starting the unit, as well as some suggestions for making adjust-

A QR code marker installed at Stoddard's Frozen Custard in Kent, Ohio, provides information about its rich, 65-year history.

ments. In addition, a demonstration wiki that includes actual student work samples from our implementations is available for viewing at **http://geohistoriandemo.wikispaces.com/**.

Third, permanent marker installation needs to be planned well ahead of time, especially if students and parents are to be involved. In our case, some installations were delayed by the weather or accessibility of the historical site at certain times of the year. A few of the markers had to be installed by city maintenance, due to their location.

Finally, it is important to make the community aware of the markers and how to access the historical content embedded in the QR codes. As this was not included in the GeoHistorian curriculum, project staff worked with the local historical society to create two brochures that were distributed locally. In addition, we wrote several pieces that were published in local print and electronic media to educate the public.

Final Thoughts
History is all around us; it is conveyed by people, buildings, and artifacts. Unfortunately, some of this history is lost when individuals die, buildings are demolished, and artifacts are destroyed or lost. Digital technologies can help preserve this history. In a sense, they allow us to become citizen journalists of the past, so that valuable memories will remain available for generations to come. Students who are exposed to the GeoHistorian curriculum use readily available and easy-to-use digital tools as they work as historians, capturing, processing, and sharing local history, often in collaboration with local residents. As such, they are no longer at the receiving end of digital history efforts. Students become active creators of digital historical content that is made available within its geographical context to anybody with a wireless mobile device, such as a smartphone, equipped with a QR code reader. This type of student learning has the potential to increase student appreciation of their local community, its history, and the social studies in general. 🔵

Notes
1. National Council for the Social Studies, "Technology Position Statement and Guidelines," (2006): www.socialstudies.org/positions/technology.
2. For examples of QR code use in education, see Helen Crompton, Jason LaFrance, and Mark van 't Hooft, "QR Codes 101," *Learning & Leading with Technology* 39, no. 8 (June/July 2012): 22-25.
3. The GeoHistorian Project (2010-2011) was funded by the National Endowment for the Humanities under Grant HD51129-10; Any views, findings, conclusions, or recommendations expressed in this article do not necessarily reflect those of the National Endowment for the Humanities; Kent Historical Society (Kent, Ohio): www.kentohiohistory.org; Kent City Schools (Kent, Ohio): www.kentschools.net.
4. National Council for the Social Studies, *National Curriculum Standards for Social Studies: A Framework for Teaching, Learning, and Assessment* (Washington D.C., NCSS: 2010); National Council for Teachers of English/International Reading Association, *The Standards for the English Language Arts* (Urbana, Ill., NCTE: 1996); International Society for Technology in Education, *National Educational Technology Standards for Students* (Eugene, Ore., ISTE: 2007), www.iste.org/standards/nets-for-students.

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Creating QR Codes

QR codes are versatile and easy to create. Just follow these simple steps:

1. Find a QR code generator.
2. Choose the type of code you want to create.
3. Enter the necessary information.
4. Click "Submit."

The QR code should now appear on your screen. You can copy and paste it, or save it as an image file for future use.

Also, here are some pointers to avoid common mistakes:

- QR codes should be at least one inch square. Some camera phones, especially older ones with lower resolution cameras, will not be able to recognize a QR code if it is too small.
- Always leave a small white border around a QR code. Mobile readers need this border to discern QR codes from surrounding information, such as text or images.
- Use a URL shortener such as bit.ly to make QR codes less complicated. The longer the embedded URL, the more pixels a QR code will have.
- Always test a QR code before making it public, especially when using a particular QR code generator for the first time. You want to make sure the embedded information is correct and can be read by as many different devices as possible.

Reading QR Codes
To read a QR code, you need a mobile device with a camera, Internet access, and a QR code reader. QR code readers are usually free and can be downloaded from various websites and app stores. Many sites will recognize your device and download the appropriate reader for your device. Once installed, all you do is launch the QR code reader, which will use the device's digital camera to scan the QR code. The reader will convert the embedded information, and the mobile device will perform the respective action, such as accessing a video online.

QR Code Generators and Readers
QR codes can be created for free on many websites, such as the ones below. Most of these sites also offer QR code readers. BeQRious: **beqrious.com**; I-nigma: **www.i-nigma.com**; KAYWA: **qrcode.kaywa.com**; Maestro: **www.sparqcode.com**; Mobile Barcodes: **www.mobile-barcodes.com**; QR Stuff: **www.qrstuff.com**; Snap.vu: **snap.vu**