Understanding Complex Landscape of Memory, Commemoration, and Culture with Location-based Technology

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Abstract: Current and emerging technologies provide increasing levels of situation- and location based information. It is critical in an increasingly information- and knowledge-based society that visitors, citizens, and students are prepared to access, think critically about, and process that information. This panel will illustrate a series of proof of concept projects that leverage the emerging technologies of location-based technologies to enhance the educational experience at sites in the United States and Europe. This projects leverage technology to not only access information, but to build materials for formal (classroom-based) as well as informal (site-based) learning. These materials have value for teachers and students in classrooms across America, and they also be important additions to the on-site and at-memorial visitor experience.

Keywords: Memory; commemoration; culture; location-based technology.

1. Moderator Andy Mink Will frame the session with a detailed summary of educational trends in the digital age with a particular emphasis on memory and commemoration. As access to big data increases, schools and universities must provide new opportunities for student investigation, inquiry, and production. The National Humanities Center is the only research center in the world dedicated to the humanities, and these emerging technological tools provide a powerful means to accomplishing a greater understanding of cultural landscapes.

2. Chris Bunin Will feature the use of geospatial technologies allows the interactions of place, space, time, and scale to be more obvious to teachers and students. Often there is an over-emphasis on the chronology of historical events and without a strong consideration for their connections to geography. We expect these technologies to raise the critical ability to answer not only the important of *"where?"* but also *"why, there?"* In 2012, ESRI launched ArcGIS Online (AGO) which allows users to upload, symbolize, filter, and display data sets in real time. Unlike other Web mapping tools, AGO fosters interdisciplinary connections because the user is allowed to collect, upload, and

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interact with the data in real time in the cloud. Most other geospatial tools limit the user's access to the data, which in turn limits the inquiry process. The possibilities for classroom application are tremendous. Rather than writing a research paper on a historical event, students can interrogate the sources and materials (e.g., publications, historic maps, primary source accounts), geo-tag the information, and present their findings in the form of an interactive map. Activities and lessons allow students to utilize AGO to translate digital archives into interactive maps that visualize and explain personal, political, and cultural narratives from
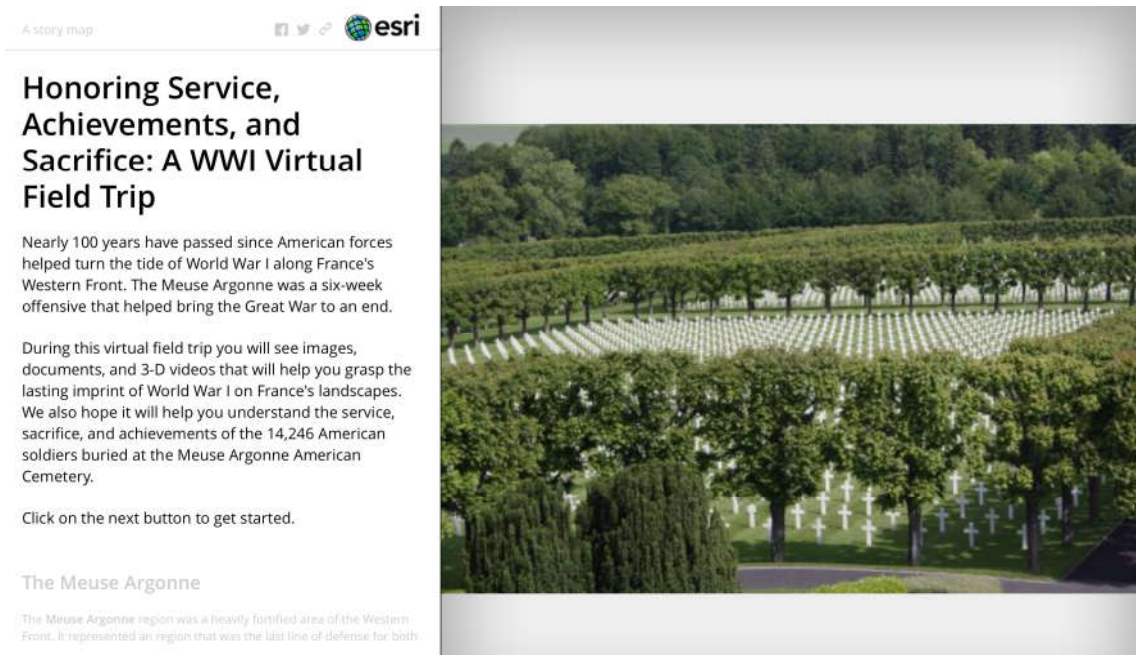
a complex landscape.

Of course, due to time constraints some teachers may shy away from such an immersive learning experience. To address this need, we will also create classroom materials that are ready to go in the form of a series of Story Maps based on ABMC materials and resources. Story Maps use geography as a means to organize and present information. They tell the story of a place, event, issue, trend, or pattern in a spatial context. These interactive maps also contain other rich content like photos, video, and audio that are basic and intuitive to the user.
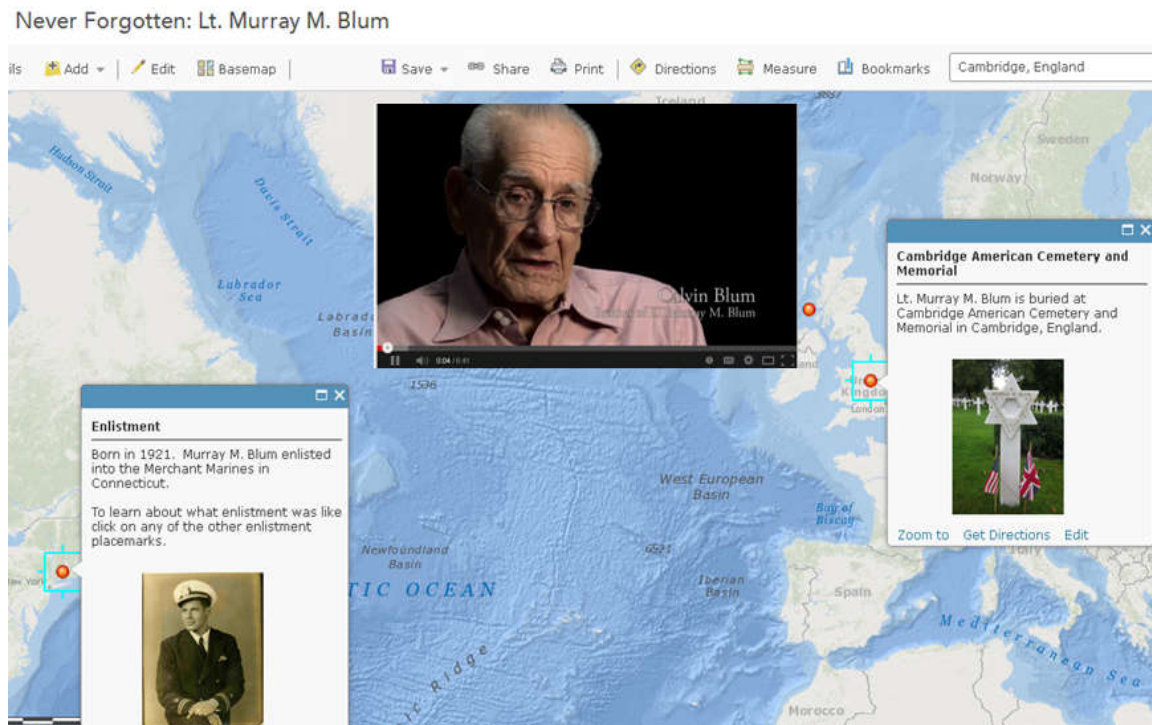
These digital maps will provide access to the narrative stories of each individual and each site featured in this project. We will share several project examples, including the Meuse-Argonne region of World War I, the American Civil War, and the Transatlantic Slave Trade

3. Matt Dunleavy Will focus on the use of Augmented Reality, which by its nature is site-based, adding content to the environment in which the user currently resides. **FreshAiR™** will used to add on-site, location-based or augmented reality (AR) tour experiences that will supplement currently offered tours, bolster self-guided tour options, and increase overall visitors' understanding and appreciation for the experience, service and sacrifice of specific sites.

FreshAiR™ is a lightweight mobile app developed at Radford University that allows digital assets to be geo-tagged to a location. These assets can be in the form of text, image, audio, or video, and the device allows for interaction with these materials while on a walking tour of a landscape or site. http://www.playfreshair.com/

FreshAiR™ provides two clear applications that will benefit this project as well as inform all NCA site-management initiatives:

♦*Browser-based Editor*: NHC can create custom AR experiences using our intuitive editing website, which enables them to embed an interactive layer of digital information into the grounds at and around the designated sites.

♦ *Smartphone-based App*: The story-based, participatory FreshAiR™ tours are experienced on a smartphone and use location-based technologies (i.e., GPS and compass) to present location-specific information to the visitor as they explore the grounds. As the visitor walks around the sites, a map on their phone displays digital objects on the smartphone display. As users explore their environment, the FreshAiR™ software triggers video, audio, text, and images, which provide location-specific information as well as narrative, navigation, and collaboration cues.

FreshAiR™ will be used at the sites to create customized historic tours. Visitors can experience the historic grounds at their own pace and with gain a deeper understanding of the men who fought and died during conflict. For example, as a visitor opens FreshAiR on their smart phone at the Manila American Cemetery, they would be prompted to choose a tour in either English or Tagalog, a language spoken in the Philippines. The visitor would then see an overhead map of the cemetery with specific areas designated with points of interest. As the visitor walked towards one of these digital markers, their location would trigger

content (e.g., text, audio, video) that would illuminate a specific story or experience. If a visitor were walking past graves of men who died in the Bataan Death March, a video would play explaining the history of this march and prompting the visitor to find a specific grave site of an individual. The map on their phone would then guide the visitor to this gravesite at which point another video would be triggered providing a biographical sketch of the man highlighting his life before and during the war while emphasizing how his sacrifice contributed to the War effort and eventual victory. The entire area could be populated with these stories that visitors could explore for hours profoundly illuminating the individual experiences while honoring their collective sacrifice.

While this application implies that the user must visit the site to employ the content and learning, FreshAiR creates opportunities in two key ways:

• The ability to continually refresh mobile content is a return driver for visitors

• The ability to display content from a distance means that educators can bring the site experience to any school grounds in the world and embed that content on a local site

After consulting with the NHC, reviewing digital resources, and reviewing recent literature on mobile, location-based AR design, the following design elements were identified as requirements for these experiences:

1) Immerse the visitor in a compelling and powerful narrative with elements of mission, purpose, exploration and interactivity.

2) Prompts meaningful observation and interaction with the physical environment.

3) Beyond what they could observe or read.

4) Deeper understanding of the history.

5) Presents material with rich multimedia whenever possible.

6) Presents historically accurate accompanied with biographical information on individuals who are memorialized at the respective sites.

7) Maintains a sensitive and respectful approach to the community, their families and the site.

8) Provides a linear, individual mobile learning experience that also allows for opportunities for family, class, or friend collaboration.

9) Presents the visitors with problem solving activities that result in increased retention of historical facts.

10) Enables host to build upon or extend the initial Realities or experiences with a serial or sequel approach that serves as a return driver.

11) Incorporates best practices from augmented and alternate reality learning and gaming (e.g., scoring mechanisms, role-based participatory story-lines, etc.).

12) Aligns with research on intrinsic motivation. In other words, it incorporates elements of the following taxonomy: challenge, fantasy, curiosity, control, cooperation, competition, and recognition [1].

Platform: FreshAiR works on the two major smartphone platforms: Apple's iOS and Google's Android. By focusing on these two operating systems, FreshAiR will work on 90% of the smartphones on the market [2].

Visual Style: The visual style will be largely dictated by the aesthetic richness of the platform, FreshAiR, which is limited. However, all media and some formatting (via HTML) can be tailored to match the time-period and style of the game and organization (e.g., matching the colors with the color-schemes of the website).

General Activity Structure at the Sites

The basic structure of the experience will follow these steps:

Navigate to location (figure 1)

Receive site-specific historical and biographical information about the site delivered through a narrative (figure 2).

Complete a challenge (e.g., comprehension question or other assessment) requiring the application of the information presented in the previous step.

Receive an accomplishment or achievement item (e.g., History Badge) (figure 3).

Receive prompt to go to next location.

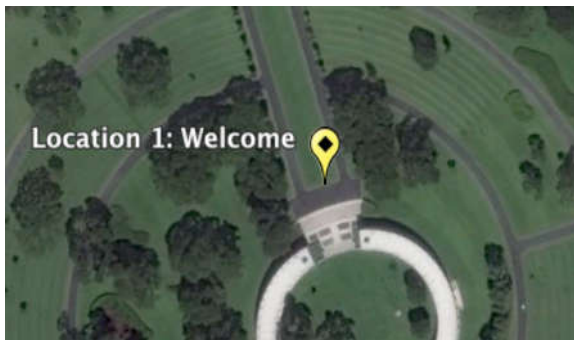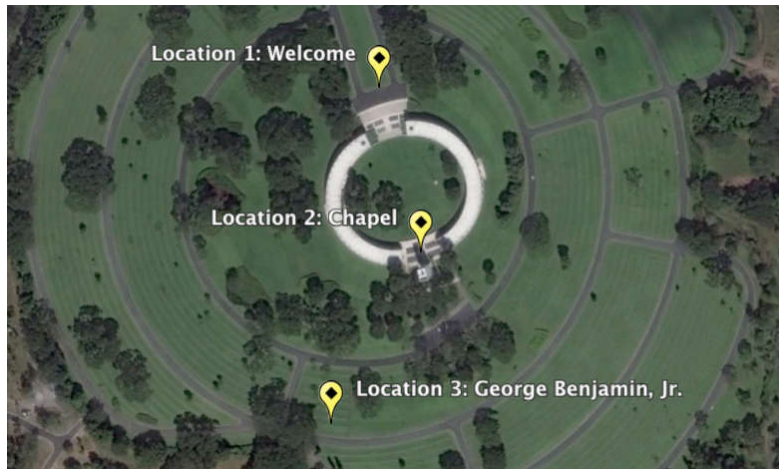On-Site Sample Experience Storyboard – On Site at Manila American Cemetery

Fig. 1. Navigate to a location 1.

Fig. 2. Receive location 1 historical information.
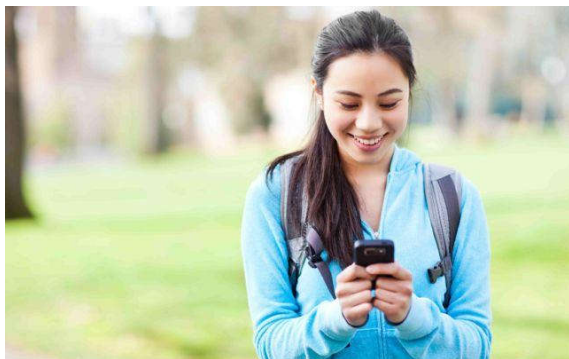
Fig. 3. Receive an accomplishment item.

Fig. 4. Receive prompt to proceed to location 2.

Note: "Screen content" is what the visitor will see, read and hear. Some of the sample content was drawn from the Manila American The "Notes" column is for the designers to explain the structure and rationale for the screen content. Cemetery website for illustrative purposes. Once art and graphics are developed, they will be placed in the "Screen Content" area as well.

Location 1: Memorial Entrance [3]	
Screen Content	**Notes**
Screen 1 (Welcome): Welcome to the tour of the Manila American Cemetery. 17,202 American and Philippine military who died in New Guinea, the Philippines, and other islands of the Southwest Pacific Area are buried in this cemetery. Most of these men lost their lives in the epic defense of the Philippines and the East Indies in 1941 and 1942 or the victorious return of the American forces through the vast islands chain. The area covers 152 acres making it the largest American Cemetery built by the American Battle Monument Commission. This mobile self-guided tour of the grounds will take approximately 30 minutes. *Click 'Done' in the upper right hand corner and look on your map to find the Chapel, your next location. Then walk towards the Chapel to receive more information.*	**Media:** As visitors enter the Cemetery, the guards could handout out information making visitors aware of the mobile tour, and prompt them to download FreshAiR. After downloading and opening FreshAiR, the visitor will immediately see the mobile location-based tour of the grounds. Visitors would then be greeted with Screen 1. This introduction could be delivered via audio, video (e.g., ABMC Manila American Cemetery Video), text and pictures, or both to make it as accessible as possible. **Narrative/mechanics:** The player is introduced to purpose of the tour and the general history of the site. The player is also introduced to the basic device functions.
Time at Welcome: 1-2 minutes: Estimate Total Experience Time: 1-2 minutes	
Visitor physically moves from entrance of Cemetery to the Chapel (3-5 minutes). When the visitor comes within approximately 30 feet of the chapel, the following content will be automatically triggered on their phones.	
Screen 2 (Chapel): Standing before you is the Chapel. This chapel provides visitors a place to pray and meditate on the lives and sacrifice of the men buried at this sacred site. Look above the doorway of the chapel. Do you see the relief sculpture? Look at the sculpture and reflect upon what this may symbolize. After reflecting upon the symbolism of this sculpture, *click 'Done' in the upper right hand corner to test how well you understand this symbol…*	**Media:** See above. **Narrative/mechanics:** The visitor is prompted to observe and reflect upon their environment. In this example, a comprehension question is posed, which requires the visitor to more deeply engage with the meaning of the sculpture engraved above the entrance to the chapel. In similar fashion, the entire grounds could be embedded with observation and interaction prompts to invite the visitors to learn about and reflect upon the memorial and surrounding graves.
Screen 3 (St George and the Dragon Comprehension Question) What could the sculpture symbolize? (multiple choice) *Click 'Done' in the upper right hand corner and look on your map to find the grave of a Medal of Honor recipient, Private First Class Benjamin George. Then walk towards the Private George's grave to learn more about this hero's story and sacrifice.*	**Media:** Text **Narrative/mechanics:** The visitor is periodically asked comprehension questions that serve to invite interaction with and reflection upon the surrounding environment. In this case, the visitor is asked a question about the sculpture of St. George and the Dragon in hopes that they would grasp the symbolism of good versus evil as well as sacrifice. Comprehension questions can be embedded throughout the area.
Time at Chapel: 2-4 minutes: Estimate Total Experience Time: 6-11 minutes	
*Visitor physically moves from the Chapel (3-5 minutes) to the gravesite of Private George. When the visitor comes within approximately 30 feet of the grave (*Plot B Row 7 Grave 156)*, the following content will be automatically triggered on their phones.*	
Screen 3: George Benjamin, Jr., Private First Class U.S. Army, Killed in Action December 21, 1944 on Leyte Island, Philippines	**Media:** This story of Private George could be delivered via audio, video, text and pictures.

Medal of Honor Recipient Grave: Plot B Row 7 Grave 156 "He was a radio operator, advancing in the rear of his company as it engaged a well-defended Japanese strong point holding up the progress of the entire battalion. When a rifle platoon supporting a light tank hesitated in its advance, he voluntarily and with utter disregard for personal safety left his comparatively secure position and ran across bullet-whipped terrain to the tank, waving and shouting to the men of the platoon to follow. Carrying his bulky radio and armed only with a pistol, he fearlessly penetrated intense machinegun and rifle fire to the enemy position, where he killed 1 of the enemy in a foxhole and moved on to annihilate the crew of a light machinegun. Heedless of the terrific fire now concentrated on him, he continued to spearhead the assault, killing 2 more of the enemy and exhorting the other men to advance, until he fell mortally wounded. After being evacuated to an aid station, his first thought was still of the American advance. Overcoming great pain he called for the battalion operations officer to report the location of enemy weapons and valuable tactical information he had secured in his heroic charge. The unwavering courage, the unswerving devotion to the task at hand, the aggressive leadership of Pfc. Benjamin were a source of great and lasting inspiration to his comrades and were to a great extent responsible for the success of the battalion's mission."[4]	**Narrative/mechanics:** The idea would be to bring the men to life by sharing their stories both before and during the war. In this case, Private George was a medal of honor recipient and his citation is quoted here along with his photograph. One possibility is to have a relative (e.g., a great granddaughter) of the highlighted men to read the citation on video and then embed this video into the location. This juxtaposition of the living with the dead could emphasize the sacrifice these men made and celebrate the freedom and life their deaths' continues to provide to this day.
Time at Private George's grave: 2-4 minutes: Estimate Total Experience Time: 8-15 minutes	

Visitor continues to move throughout the cemetery being guided and taught about the stories of heroism and sacrifice that surround them.

Off-Site Sample Experience Description and Literature Review – Any School on the Globe. In addition, FreshAiR can be leveraged to provide off-site, mobile location-based experiences for students who cannot visit the actual sites. These off-site FreshAiR experiences will in effect bring the stories of this historical period and of the individual men who served to the school grounds. Rather than the students going to the site, the site would come to the students. The scenario below provides an example:

When the bell rings, the eager eighth-grade students pour out of the building with their cell phones and gather around their history teacher. The teacher explains that the day's lesson will require them to explore the experience of soldiers and their families during World War II. As the students exchange quizzical looks, one of them asks, "Are we going on a field trip to a museum?" "No," the teacher responds, "the museum is coming to us." She instructs them to turn on their GPS-enabled smartphones to begin the lesson. As they do so, digital characters and items begin to appear on their smartphone screens. Running across the school grounds, the students meet soldiers and families who soldiers deployed. Nearing the water fountain, a video file of the Bataan Death March plays on the students' phones. A letter written by a mother to her son on the eve of the invasion of Guadalcanal is revealed behind the gymnasium. Across the once-familiar school grounds, students work together to discover multiple inter-connected stories leading them down the path of historical inquiry-based learning, collaborative problem solving, and

Figure A. Students exploring environment.

Figure B. Students experiencing embedded stories.

appreciation for the sacrifice endured by the military and the home front during World War II.

While the scenario described above may seem fantastic, this instructional model is not only possible, it has been implemented numerous times by the FreshAiR team and collaborating educators. The story-based, mobile augmented reality (AR) lessons developed by the FreshAiR team are experienced on smartphones (Figure A) and use GPS technology to correlate the students' real world location to digital artifacts embedded within school sites.

As the students walk and run around their school playground or sports fields (Figure B), a map on their handheld displays digital objects and virtual people who exist in an AR world superimposed on real space (Figures C & D).

When students come within approximately 20 feet of these digital artifacts, the AR and GPS software triggers video, audio, and text files, which provide academic and collaborative problem solving challenges as well as narrative, navigation, and collaboration cues.
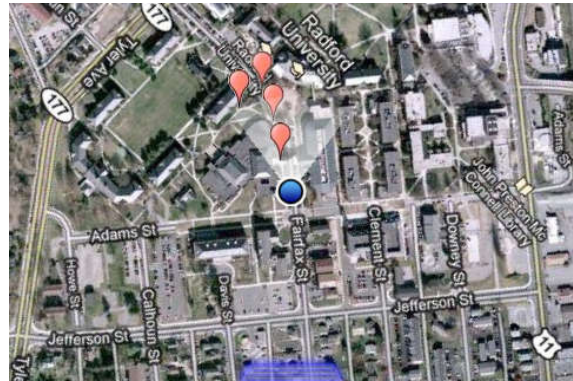

Figure C. Overhead view.

Figure D. Live view.

This type of interactive, mobile learning superimposes a layer of digital resources over a real physical environment, augmenting students' experiences by providing interactive, situated, collaborative and physical learning activities as well as narrative, navigation, and collaboration cues. This type of interactive, mobile learning superimposes a layer of digital resources over a real physical environment, augmenting students' experiences by providing interactive, situated, collaborative and physical learning activities as well as narrative, navigation, and collaboration cues.

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4. Dr. Christian Lentz Will conclude by providing specific ways that these location-based and mobile-based tools can be a greater asset to the study of Vietnam and its relationship with the United States. This conclusion will also share details of the new TransPacific Teacher Scholars Program that has been funded by FIRST and will be launched in 2017.

References

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[2] http://www.techrepublic.com/article/apple-v-google-the-goliath-deathmatch-by-the-numbers-in-2014/

[3] https://www.abmc.gov/sites/default/files/publications/Manila_Booklet.pdf

[4] http://www.history.army.mil/html/moh/wwII-a-f.html

Hiểu rõ bối cảnh phức tạp giữa trí nhớ, kỷ niệm và văn hóa với công nghệ dựa vào vị trí

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Tóm tắt: Công nghệ mới hiện nay cung cấp nhiều cấp độ thông tin dựa trên tình hình và vị trí. Điều này rất quan trọng trong một xã hội ngày càng dựa trên tri thức và thông tin mà những người tìm hiểu thông tin, các công dân, và học sinh đều được chuẩn bị để tiếp cận, cân nhắc kỹ càng, và xử lý các thông tin đó. Nhóm nghiên cứu sẽ minh họa một loạt các minh chứng về các dự án tận dụng kỹ thuật mới của công nghệ dựa vào vị trí để gia tăng trải nghiệm trong giáo dục tại một số website ở Hoa Kỳ và Châu Âu. Điều này không chỉ nâng tầm công nghệ để tiếp cận thông tin, mà còn xây dựng cơ sở tài liệu cho việc học chính quy (trên lớp) và cả không chính quy (trực tuyến). Những tài liệu này có giá trị cho nhiều giáo viên và học sinh các lớp trên toàn Hoa Kỳ, và điều này cũng là bổ trợ quan trọng cho các trang web và trải nghiệm để lại dấu ấn cho những người quan tâm.

Từ khóa: trí nhớ; kỷ niệm; văn hóa; công nghệ dựa vào vị trí.