

## Thematic Videoconferencing and 3D Memorial Design in History Education

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Monuments, often aesthetically striking and colossal in size, are forms of civic art. In his book, *Monument wars*, Kirk Savage (2009), likened the monumental core in Washington, D.C. to a civic pilgrimage site. Visitors to the capitol are often awed by architectural and sculptural designs and inscriptions from historic sources. Memorials contribute to a sense of national

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identity as people collectively engage in acts of remembering. In recent decades, memorials have become places where people engage psychologically and emotionally (Savage, 2009).

Millions of Americans visit memorials each year. In doing so, they engage in meaning making. Before memorials, individuals contemplate the past and present. Sam Wineburg (2001, p. 5, 6) described the allure of the past, “The familiar past entices us with the promise that we can locate our own place in the stream of time and solidify our identity in the past...the strangeness of the past offers the possibility of surprise and amazement, of encountering people, places, and times that spur us to reconsider how we conceptualize ourselves as human beings.”

In this action-research project, the authors explored technological and interdisciplinary approaches to the study of war and memorials in high school. The theoretical foundations of this article lie in Deweyan constructivism. A proponent of experiential learning and arts integration, Dewey recognized the value of integrating physical and social surroundings in instruction (Dewey, 1938/1997). Deeper and project-based learning theories also influenced the study (Bellanca, 2015; Zhao, 2015; Trilling, 2015). Deeper learning requires critical thinking, collaboration, and the ability to transfer and apply knowledge (Bellanca, 2015). Students solve problems, cultivate empathetic perspectives, and work creatively on relevant products (Zhao, 2015). In this study, the researchers explored essential questions: *Would a thematic videoconferencing series on war and memorials advance students’ understanding of history? If so, how?; Would designing memorials with 3D pens increase students’ interest?; What would students learn from working with 3D pens?; How would the study of memorials engage students in historical inquiry?*

### **The School and the Participants**

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During the 2016-2017 academic year, the videoconferencing series and design project were implemented at an all-boys public school in a large, Midwestern metropolis. The Title I, public school served middle and high school students, over 98% of whom were African American. For budgetary reasons and to optimize the learning environment during videoconferences, the size of the program was capped at 30 students. Because students at the school take United States history in the ninth grade, priority was given to students at that level, though some students in other grades participated through a pull-out process. In addition to receiving IRB approval, the professor and two full-time teachers, who conducted this study, had the support of the school's principal. The researchers are engaged in a long-term partnership to explore the integration of art and technology in the social studies.

### **The Project**

A series of videoconferences was organized on war and memorials. An aim was to advance students' understanding of the major wars in which the United States has been involved, without glamorizing war and conflict. The videoconferences were held in the fall and spring semesters. Most of the videoconferences had a duration of 40 minutes, though one lasted 20 minutes. Via Zoom or Skype, the students communicated with museum professionals, veterans, and government officials associated with the African American Civil War Museum, the Woodrow Wilson Presidential Library, the National World War II Museum, the Korean War National Museum, the National Vietnam War Museum, and the American Battle Monuments Commission. In addition, the young men interviewed veterans of the wars in Afghanistan and Iraq, who visited the school in person. Both veterans worked at local universities, and they volunteered to present and to field questions.

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The presenters utilized different teaching strategies, methods, and materials during the videoconferences. The format supported interaction. History came alive during the videoconference with the African American Civil War Museum when the students were treated to a demonstration by a historic interpreter in Civil War costume who explained and showed the weapons and personal artifacts of soldiers. Prior to meeting with the students on behalf of the National Vietnam War Museum, a veteran of the war sent booklets. From an office in Texas, he then engaged the students in a question-and-answer format. A museum educator at the Korean War National Museum gave a slideshow on the Korean War that sparked multiple questions about current events and the potentiality of conflict. Museum specialists exposed the students to unique resources, including primary-source documents, recordings, and objects, which were sometimes held to webcams and rotated to enhance study.

The students began thinking about memorial design at the start of the project. During the series, they sketched memorials, and they explained in writing their ideas. In interactive lectures, the students studied images of war memorials such as the African American Civil War Memorial, the World War I Memorial, the World War II Memorial, the USS Arizona Memorial, the Korean War Memorial, the Vietnam Veterans Memorial, and the Tomb of the Unknown Soldier. They examined pictures of the temporary Boot Memorials. Installed at Forts Hood, Campbell, and Bragg, the Boot Memorials were comprised of one boot for every soldier who had died since 9/11 as well as photographs and biographical information. Although the focus of the project was on war memorials, the students were also exposed to other types of memorials, such as memorials to leaders like George Washington (the Washington Monument), Abraham Lincoln (the Lincoln Memorial), and Martin Luther King, Jr. (the Stone of Hope). Of the thousands of memorials that exist in the United States, these memorials were chosen because they highlight

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many of the different roles and functions of memorials in society. The students reflected on how people experience commemorative sites.

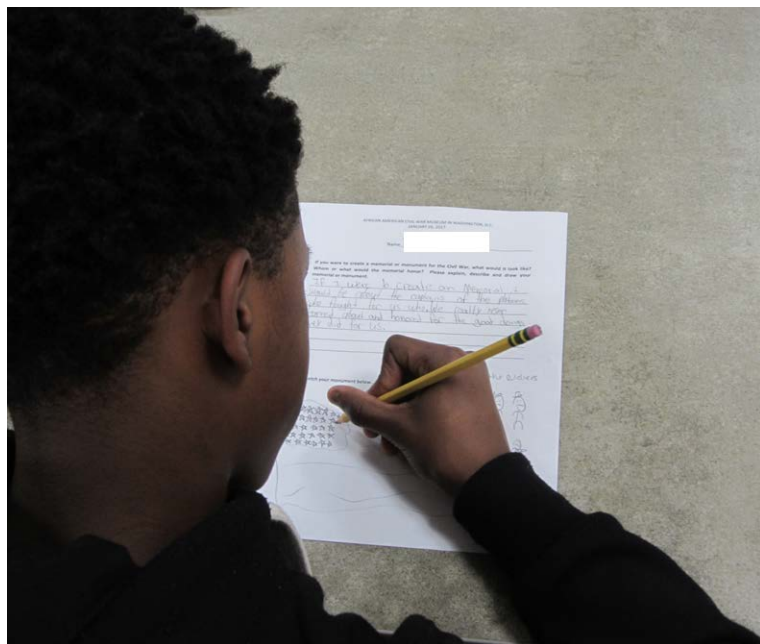


Figure 1. A student designed a war memorial after a videoconference.

To support inquiry, the students conducted independent research. On the websites of the Library of Congress and the National Park Service, they found images and information on memorials of their choice, recorded names and locations, and responded to these prompts in writing: *a) Describe the design. What will visitors see and experience when they visit the memorial?; b) What thoughts and/or feelings does the memorial evoke?; and c) Why did you select the memorial?*

After the videoconferencing series, the students created memorials using 3D pens for a Memorial Day display. In an additive process, the students made sculptures with PolyLactic Acid (PLA) filament on glass. PLA filament was selected because it is biodegradable, does not emit noxious fumes, and can be used at a lower temperature than its alternative, Acrylonitrile-Butadiene Styrene (ABS), an oil-based plastic. To scaffold the activity for students who were

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not artistically inclined, stencils and glass objects were available for tracing and modeling. The students had the option of working individually or in design teams. Chosen by educators on the basis of design, four 3D memorials were displayed for a two-week period in a prominent location at a local university. The university's Office of Veterans Affairs sponsored the installation, and a veteran judged the projects for prizes. In a slideshow, the students later viewed pictures of their display. The winning designers received certificates and notepads.

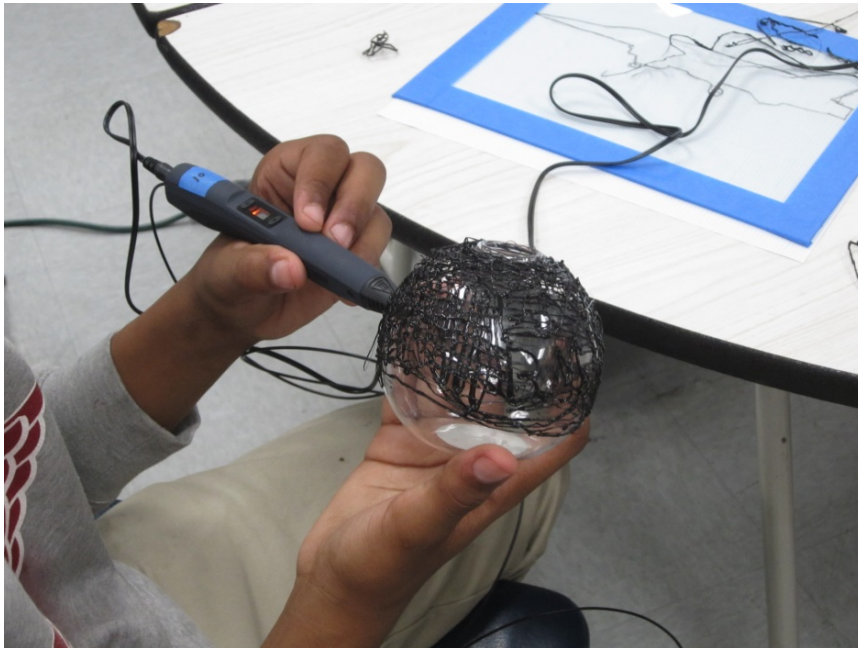


Figure 2. Students had the option of sculpting with glass objects.

### **Research Methods**

Mixed methods were utilized in this action-research project to address the research questions. In action research, researchers engage in systematic and rigorous inquiry to advance understandings of educational practices and the learning process (Stringer, 2014; Mertler, 2014). Mixed-methods approaches yield quantitative and qualitative findings, thereby offering

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comprehensive understandings (Greene, 2007). The authors designed a seven-item survey with an embedded design. On Likert scales, participants in the study were asked to indicate the degree to which they agreed or disagreed with five statements. Following each Likert-scale item, they had the option of writing comments. The statements were *a) Participating in videoconferences on the theme of war advanced my understanding of history, b) Designing memorials with 3D pens increased my interest in the social studies project, c) The project advanced my understanding of the roles of memorials in society, d) Knowing that our 3D sculptures would be displayed and seen by veterans at a university increased my interest in the project, and e) The project raised my awareness of how Memorial Day is observed.* The sixth item on the survey posed an open-ended question: *What did you learn about designing with 3D pens?* On the last item, respondents were invited to write additional comments.

Distributed in hard copy, the survey was optional. In order to avoid tracking participants, the researchers administered the survey on only one day. Of the 30 students who were present, 28 participants opted to complete surveys. Four students had been absent when the pens were used to design the sculptures. Those students made notations about their absences on their anonymous surveys. Thus the responses of 24 students yielded the data for the second, fourth, and sixth items on the survey: *Designing memorials with 3D pens increased my interest in the social studies project; Knowing that our 3D sculptures would be displayed and seen by veterans at a university increased my interest in the project; and What did you learn about designing with 3D pens?*

The data were entered manually into the cloud-based, data-analysis tool, SurveyMonkey. The students' comments were read repeatedly by the researchers who chose representative

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comments for this article. The credibility of the research was further established through prolonged engagement, persistent observation, and field notes (Stringer, 2014).

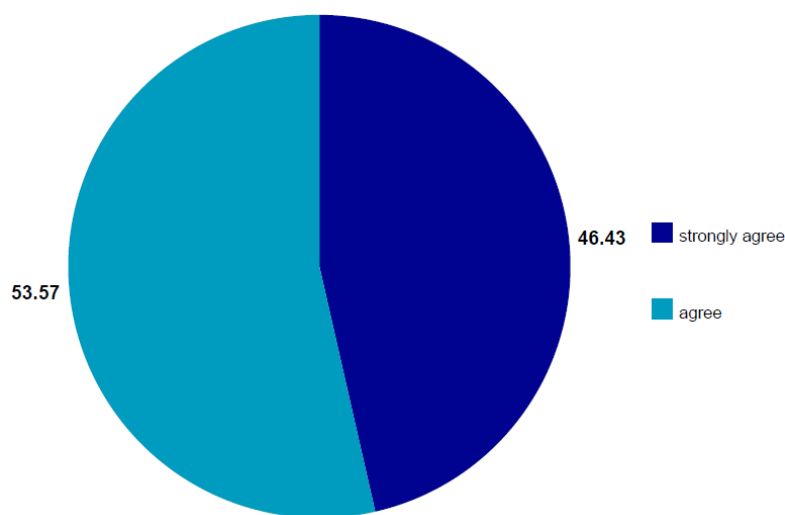
### Findings

In thematic instruction, students make connections as they explore broad concepts, and their history lessons coalesce. The findings of this study indicate that thematic videoconferencing with specialists in museums and agencies increases students' historical understanding. Of the participants, 46% strongly agreed that participating in the videoconferences on the theme of war had advanced their understanding of history. Over 53% agreed. No student disagreed with this statement. The students found the opportunity to see and talk with specialists to be beneficial. On their surveys, the students wrote the following:

“The videoconferences bettered my understanding of the history of the wars...”

“I really enjoyed being involved in the videoconferences because I got to ask questions that only they could answer.”

“The videoconferences allowed me to gain knowledge about history that I wouldn't have found elsewhere.”





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Figure 3. Participating in videoconferences on the theme of war advanced my understanding of history.

Of the students who had worked with the 3D pens, over 70% strongly agreed (41.67%) or agreed (29.17%) that designing memorials with 3D pens had increased their interest in the project. One quarter of the students were neutral, and four percent disagreed. Students made the these statements about 3D design and creativity:

“Being able to design a memorial allowed me to become more in tune with the social studies project.”

“With the 3D pens, I wanted to design...and see what I could make.”

“...it’s interesting to draw something that you can touch.”

“...this activity was very thoughtful and creative which made it fun.”

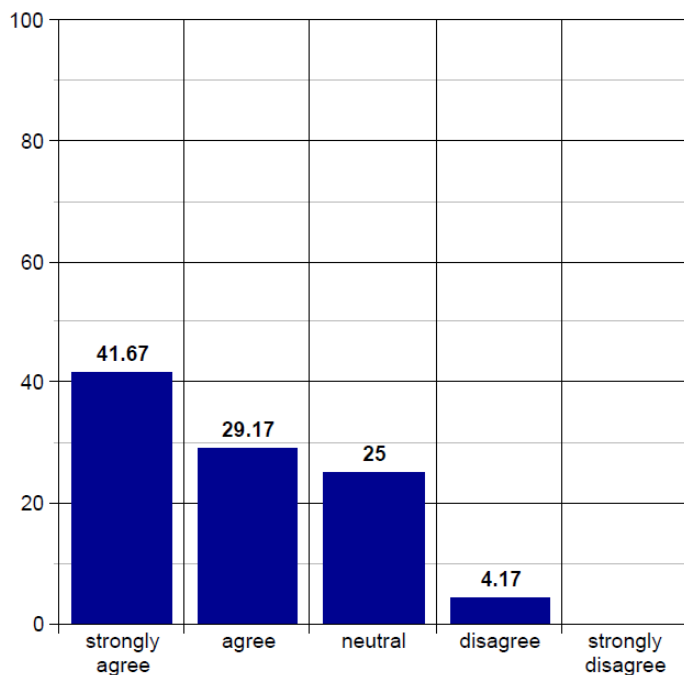


Figure 4. Designing memorials with 3D pens increased my interest in the social studies project.

Prior to this project, no student had ever used a 3D pen. To the open-ended question, *What did you learn about designing with 3D pens?*, the students wrote primarily about the tool,

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material, and technique. Several young men noted the heat necessary to use 3D pens effectively. Students commented on the need for focus and a steady hand when designing sculptures. For two participants, the activity had illustrated the diversity of forms that memorials can have. The comments of multiple students suggest that the experience had raised their awareness of their creative abilities and potential:

“I can make a 3D sculpture, and it’s cool.”

“(I learned) how to form a design.”

“I learned that using the 3D pens brings art and creativity.”

Prior to sculpting, the students were informed that some of their 3D memorials would be displayed and seen by veterans at a local university around the time of Memorial Day. The vast majority of the participants (80%) indicated that knowing that their 3D sculptures would be exhibited and viewed by veterans had increased their interest in the project. On the surveys, 52% of the participants strongly agreed, and 28% agreed. Sixteen percent were neutral, whereas four percent disagreed. The following comments were representative:

“Knowing that my sculpture would be displayed motivated me to create something great.”

“...I wanted to impress the veterans.”

“(Knowing) made me strive for them to see it.”

The majority of the students (over 71%) indicated that the project on war and memorials had advanced their understanding of the roles of memorials in society. Over 53% strongly agreed and 32.14% agreed that the project had, whereas 3.57% disagreed and 10.71% were neutral. Multiple students reported that, prior to the project, they had known little about

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memorials. In their comments, students also wrote about the purposes of memorials and how people relate to them.

“This project taught me a lot about memorials and how they affect society.”

“Memorials help honor what they did for the world, and for their people.”

“Many people go to memorials so they can be reminded of what a beloved person stood for.”

The students gained understanding of the manner in which Memorial Day is observed. Of the participants, 85.71% either strongly agreed (53.57%) or agreed (32.14%) that the project had raised their awareness of how Memorial Day is observed. During the project, they had learned about wreath laying by presidents at the Tomb of the Unknown Soldier, the placement of wreaths and flags in cemeteries in local communities, visits to memorials, and other Memorial Day practices. The following statements were representative.

“(The project) helped me get a better understanding of what Memorial Day really is.”

“It shows how grateful people are for the soldiers who gave their lives...”

“...Memorial Day is to show respect, and with the projects, that’s what we did.”

The final item on the survey invited the participants to write additional comments. Students commented on having learned about the realities of war and violence. They also wrote about having met new people. The young men used adjectives such as “eye-opening” and “enlightening” to describe the experience.

## Discussion

### Teaching History with Memorials

From the study of memorials, students learn about diverse perspectives of history, culture, and art. Architects and artists make conscious choices when designing memorials, and

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they typically have input from interested parties or stakeholders, officials, and members of the public (Upton, 2013). Representations of history by monuments in the public sphere have frequently been subjects of controversy; people's views of whom should be honored change and differ (Doss, 2010). Monuments impact the spatial order, and they have defined squares and centers (Savage, 2009). As time passes, memorials to lesser known people or events are sometimes viewed as obsolete or anachronistic (Savage, 2009). In contextualizing memorials, students see that history is dynamic. As they grapple with significance, identify interpretations, and consider continuity and change, students engage in the process of historical inquiry (Seixas, 1996; Lévesque, 2008).

The Lincoln Memorial, designed by architect Henry Bacon and sculpted by Danielle Chester French, educates the public about the sixteenth president as well as the Civil War. In addition to the dedication, two unabridged speeches were inscribed on the memorial: the Gettysburg Address and Lincoln's second inaugural address. Originally delivered at the dedication of the Soldiers' National Cemetery in 1863, the Gettysburg Address, in which Lincoln evoked principles of liberty, equality, and freedom, was inscribed on the wall of the south chamber of the memorial. Delivered in March of 1865, about one month before the Civil War ended, Lincoln's second inaugural address, on the north chamber wall, addressed reunification. On the website of the National Park Service, which manages the Lincoln Memorial, park rangers have recorded podcasts of the speeches. Studying these and other primary sources will advance students' historical literacy (Nokes, 2013).

The Lincoln Memorial has become a historic backdrop to a larger, historical narrative of civil rights. The memorial is a site where people have performed, demonstrated, and celebrated. In 1939, after being denied the opportunity to sing at Constitution Hall, Marion Anderson, with

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the support of Eleanor Roosevelt, sang at the Lincoln Memorial before an audience of 75,000 (Savage, 2009). Her rendition of *My country, 'tis of thee*, also known as *America*, was transmitted by radio. Twenty-four years later, Martin Luther King, Jr. delivered his *I have a dream speech* in front of the memorial. Symbolically, the Obama Inaugural Celebration was held at the Lincoln Memorial in 2009. In his book, *Monument wars*, Kirk Savage (2009, pp. 255, 257), described the Lincoln Memorial as the “psychological anchor of the Mall” and a “space of moral principle.”

Like the Lincoln Memorial, the National World War II Memorial utilizes inscriptions of primary sources to educate. Under the direction of the American Battle Monuments Commission, the National WWII Memorial was built to render the significance of the war, to honor the WWII generation, and to extoll democratic values (Brinkley, 2004a; Brinkley, 2004b). Designed by architect Friedrich St. Florian, the oval-shaped monument is defined by its Memorial Plaza and Rainbow Pool. In granite are the inscriptions of the words of military and political leaders of the time, including Franklin Roosevelt and Dwight Eisenhower (Brinkley, 2004b).

The bronze narrative panels at the ceremonial entrance to the National World War II Memorial, by sculptor Ray Kaskey, lend themselves to the teaching of U.S. involvement. Twenty-four narrative bronze panels in bas relief depict the country’s mobilization. In the process of designing the panels, Kaskey visited the National Archives repeatedly (Uth, 2004). Photographs of a number of the panels are on the websites of the National Park Service and the Library of Congress. In the analysis of panels during this action-research project, the educators employed Visual Thinking Strategies; the students were asked, *What is going on in this image?*; *What do you see that makes you say that?*; and *What more can you find?* (Yenawine, 2013).

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These strategies required students to observe closely. Within the context of a history class, applying disciplinary concepts and tools is critical (National Council for the Social Studies, 2013). Students must have prior historical knowledge in order to evaluate meaningfully Kaskey's sculptures. Asking students to identify the sculptor's interpretations and omissions cultivates critical thinking (Cf. Nokes, 2013).



Figure 5. *Normandy Beach Landing*, World War II Memorial

Ray Kaskey Studios

Bas relief

Carol M. Highsmith, photographer, 2006

Library of Congress

Washington, D.C.

Memorials have multiple societal functions; they are places where people reflect, pay respects, grieve, and honor. Built with donations from veterans' organizations, individuals, and corporations, the Vietnam Veterans Memorial now bears the names of the 58,307 military personnel who died in Vietnam or who were missing in action. In reflective, black granite, the names are listed in chronological order without designations of service or rank (Scruggs &

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Swerdlow, 1985). The memorial was meant to reconcile the nation while honoring those who had served and died (Scruggs & Swerdlow, 1985). Since the Vietnam Veterans Memorial opened to the public in 1982, people have left flowers, wreaths, flags, notes, and personal artifacts (Scruggs & Swerdlow, 1985). Veterans groups have organized trips to the site to mourn and heal. Family members and friends have touched and rubbed the inscriptions of the names of the deceased onto sheets of paper (Hagopian, 2009). With her abstract design, Maya Lin created a contemplative space. In her book, *Boundaries*, Lin (2000, p. 4:16) wrote, "...the design was experiential and cathartic, and, most importantly, designed not for me, but for them (the veterans)...the chronology of names allowed a returning veteran the ability to find his or her own time frame on the wall and created a psychological space for them that directly focused on human response and feeling."

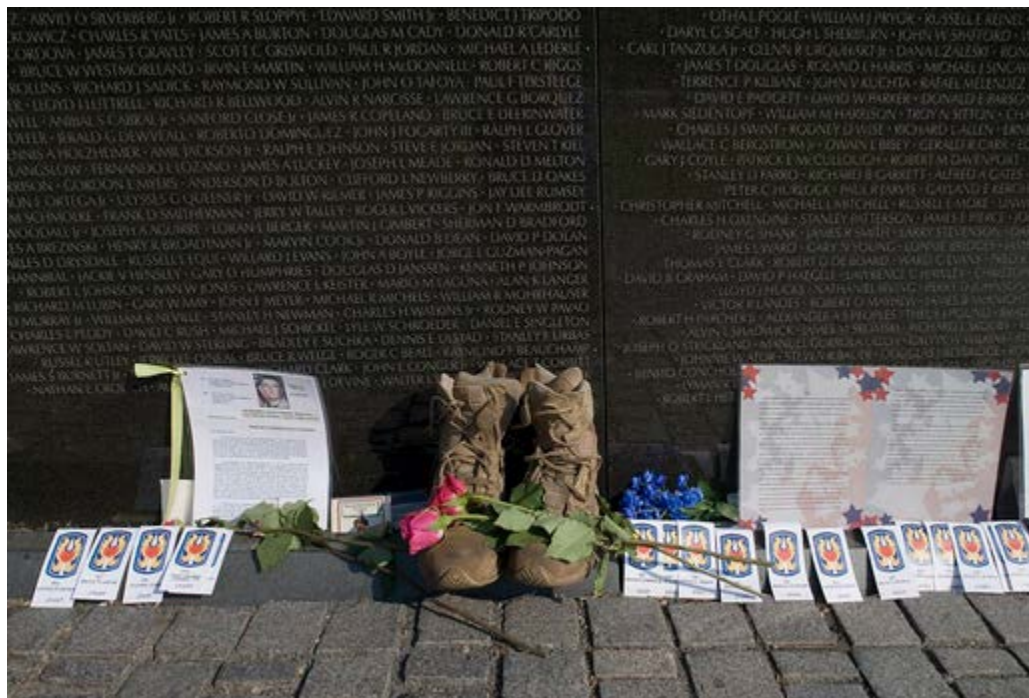


Figure 6. *Memorial Day*, Vietnam Memorial

Carol M. Highsmith, photographer, 2006

Library of Congress Prints and Photographs Division

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Washington, D.C.

When examining figurative memorials such as the African American Civil War Memorial and the Korean War Veterans Memorial, the students noted the renderings of historic uniforms and weapons. A central feature of the African American Civil War Memorial is the bronze sculpture, *The Spirit of Freedom*, by African American sculptor, Ed Hamilton. Hamilton depicted one sailor and three infantrymen on one side of the piece and a soldier in a familial context on the other. On the memorial's curved wall are the names of the 209,145 African Americans who served in the United States Colored Troops. In war and other memorials in the United States, African Americans have historically been underrepresented (Savage, 1997).

The Korean War Memorial, sculpted by Frank C. Gaylord II in unpolished stainless steel, depicts a combat patrol moving through a V-shaped, uneven field toward a U.S. Flag (Highsmith & Landphair, 1995). The lifelike troopers are wearing ponchos over their uniforms, and they carrying military hardware. At about seven feet tall, each figure is individualized and expressive. The sculptures are flanked by a granite mural by Louis Nelson. The mural's etched the portraits of troopers and support personnel are based on historic photographs in the National Archives (Highsmith & Landphair, 1995). The memorial makes the statement that what has often been referred to as the "Forgotten War" will be remembered. In viewing this recreation of a patrol scene, the students gained what Linda Levstik and Keith Barton (2001, p. 24) have described as an "imaginative entry into the past."

### **Designing Memorial Sculptures with 3D Pens**

As technological tools, the 3D pens increased students' curiosity. The learning activity afforded students the opportunity to apply authentically their knowledge. Most students worked in design teams, though some opted to work independently. The students considered what they



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had learned about veterans, uniforms, military hardware, and conditions. Designed for the Memorial Day installation, their responsive products had social meanings (Cf. Freedman, 2003; Zhao, 2015). Interestingly, the majority of the young men created projects to honor all people who had died while serving in the military.

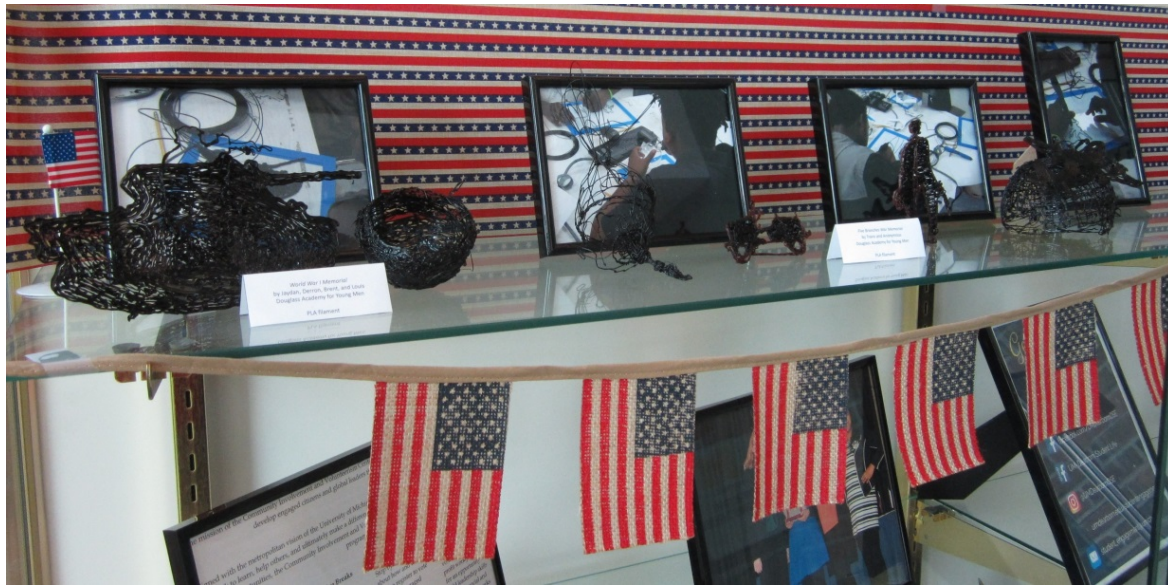


Figure 7. The students' sculptures were displayed at a local university around Memorial Day.

Based on reviews, the researchers chose the LESHP Handheld Professional 3D pen. The pen can be used with PLA or ABS filament, and it has adjustable printing speeds. Prior to implementing the project, the researchers practiced using the 3D pens, and they threaded each of the students' pens with ample PLA filament. Following a demonstration and explanation of the pen's features by a local artist, the students readily adopted the technology. Their comments on the surveys suggest that they valued the opportunity to work creatively with new tools. The project was in alignment with the standards of the International Society for Technology in Education (2017).

### **Thematic Videoconferencing**

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The findings of this study suggest that thematic videoconferencing, by deepening and extending students' knowledge, has educational value (Cf. Martin, 2008; White, 1995). Point-to-point videoconferencing offers the possibility of highly interactive communication with experts, including eyewitnesses, museum educators, government officials, and scholars, in different parts of the United States and the world (Anastasiades, 2009; Newman, 2008; Cole, Ray, & Zanetis, 2009). Through the experience, students recognize the complex, interconnected structure of knowledge, and they are exposed to different perspectives. They engage with the dynamic world beyond the walls of the classroom. Panagiotis S. Anastasiades (2009, p. 60) wrote, "Interactive videoconferencing is an essential technological medium, which, under pedagogical and social conditions, can significantly contribute to the opening-up of schools to broader social and learning environments."



Figure 8. The students listened to a historic interpreter at the African American Civil War Museum.

Videoconferencing requires equipment, namely a computer, a camera, a speaker, and a microphone. For this project, the researchers utilized the Logitech ConferenceCam CC3000e

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system, which included an omnidirectional speakerphone and camera. Mounting the camera on a tripod enabled the presenters to see the students well. A projector and screen are needed, if an interactive display is unavailable. In addition to equipment, a videoconferencing platform is required. Multiple companies offer videoconferencing services. The authors opened free Zoom accounts; Zoom is a cloud-based platform that allows for screen sharing. They also utilized the low-cost communications software, Skype for Business. Google Hangouts, BlueJeans, Polycom, and WebEx are among many popular alternatives.

When planning a thematic videoconference, after identifying relevant topics, educators should begin by visiting the website of the Center for Interactive Learning (C.I.L.C.): <http://www.cilc.org/>. Numerous museums and educational institutions have joined this hub. When this article was written, in the category of social studies, the C.I.L.C. had 102 content providers. On the site, educators may read descriptions of programs; view fees, when applicable; and make scheduling requests. The education staff of museums and government agencies, that are not members of the C.I.L.C., are often willing to host conferences when approached directly, though. In the series on war and memorials, three content providers were not C.I.L.C. members.

In advance of the videoconferences, presenters and educators should test the connections and equipment, and they ought to confer about learning objectives and expectations. Some presenters send materials in advance for distribution. Teachers play critical roles by preparing students; coordinating hands-on activities, when used; and facilitating during the conferences themselves. To enhance communication, the authors recommend that students' chairs be arranged so that they are within the range of the webcam. When the conference begins, dimming the lights will increase visibility. Due to the potentiality of technical difficulties, having short,

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alternative assignments for the students to complete while issues are being resolved is recommended.

### **Implications and Conclusion**

Thematic videoconferencing on war and memorials afforded students an integrative learning experience that advanced their understanding of history. The multi-media conferences fostered participation and increased students' levels of interest. Creating memorial sculptures for display in a real-world setting was motivational. The use of 3D pens contributed to the technology-rich learning environment and fostered creativity. Through interactive lectures, the students learned how to read memorials, and their understandings of commemorative practices grew.

This action-research project focused primarily on the exploration of United States' involvement in wars and war memorials. An exhaustive study of memorials was beyond the scope of the project; opportunities for future study remain. The examination of memorials in world history courses holds promise; in different civilizations, monuments have been erected for millennia (Borg, 1991; Low & Oliver, 2012). When they study the memorial artistic tradition, students will recognize common forms, such as obelisks, columns, narrative depictions, cenotaphs, triumphal arches and gates, and freestanding statues (Borg, 1991). As public art, memorials shape cultural landscapes, and they shed light on interpretations of history and the human experience. Interdisciplinary, creative projects on memorials, which require the transfer of knowledge, engage students in the process of historical inquiry while deepening their learning.



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