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Teaching for Lasting Learning: A Message From the Editor-in-Chief

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We no longer need to wonder about whether students have experienced trauma. . . . For higher education educators, this may be our new normal, and adjusting our pedagogy for the long haul will aid our students who are trying their best to stay engaged in their pursuit of learning. (Langlois et al., 2023, p. 183, in this issue)

Today's students have experienced major upheavals in their lives during their journey to college. From the sudden interruption in and shift to different modes of learning due to the COVID-19 pandemic to numerous events during the pandemic's aftermath, current students have experienced various forms of trauma not heretofore seen in our teaching careers. While readjusting to the "new normal" they have endured collective—and perhaps individual and personal—shock, pain and grief resulting from traumatic events such as mass shootings on our campuses. They have witnessed society's ever-increasing polarization and the resulting climate of isolation. The changes these students have endured have impacted their ability to focus and engage in learning experiences as they prepare for the 21st-century workforce. Many faculty, likewise, have experienced personal and professional disruptions of their own, and as a result they may struggle to manage their own work while meeting the needs of their students.

In this stressful climate it is especially important to recognize that both instructors and students have past and present experiences that may affect their ability to teach and learn well. One way to respect and respond constructively to these shared challenges is to cultivate resiliency through instruction that leads to lasting learning.

The articles in this issue of the *Journal* address how to design and facilitate courses and engage students in ways that will lead to enduring, authentic, and relevant learning.

Learning is deeper and more lasting when students are highly engaged, active participants. Four of the articles describe instructor-created and -facilitated innovative classroom learning experiences to increase student engagement. Students in **Wolf & Previti's** study created a "pop-up museum" about the opioid epidemic as part of a project-based service-learning (PBSL) experience. The results suggest that the pop-up museum project both grew students' skills that are valued by employers (communication, collaboration, and critical thinking) and enhanced visitors' knowledge.

Collins et al.'s institution has successfully used an extensive guest lecture format in online courses for nearly a decade. Student feedback data and the authors' reflections indicate that the use of guest lecturers provides significant benefits, including increasing the available subject matter expertise and creating networking opportunities for students, that may lead to students' long-term success. The authors make recommendations for readers teaching courses with similar goals.

Introductory courses are sometimes viewed as low-level learning experiences that are best suited to lecture methods. **Arduini-Van Hoose & Newman** compared outcomes of team-based-learning (TBL) and more traditional lecture-based instruction in a community college introductory course. The study's results support TBL's use for building a classroom culture that is conducive to participation as well as for developing "soft skills" that are important to employers such as communication and teamwork.

Students must be motivated and willing to participate in order to engage actively in learning. The value of incentives to increase student class participation was the subject of **Kauffman's** study. The author analyzes the study's results and discusses the benefits and drawbacks of using incentives for increasing student engagement.

The issue's final three articles report on efforts to promote authentic and lasting learning within and across institutions. Although commonly viewed as an essential skill for college students, critical thinking (CT) varies widely in how it is defined and applied across disciplines. Faculty members in **Yang et al.'s** study formed a multi-disciplinary faculty learning community (FLC) on CT to collaborate on a definition of CT for adoption by the university. The FLC members' reflections on implementing CT instruction and assessment in their courses provide support for university-wide pedagogy to develop this employer-valued skill.

Langlois et al., teachers at four different higher education institutions, reflected on their collective teaching experience during the pandemic. Their review of the literature on Trauma-Informed Pedagogy, Community of Inquiry, and Trauma Stewardship led to their constructing the Trauma-Informed Community of Inquiry (T-I Col) framework. This framework has provided useful guidance for the authors to confront their own and their students' experience of trauma and increase the sense of connection in what often feels like an isolated environment within the academy.

Finally, **Wyant et al.** addressed the challenge to support graduates for success in a diverse global workplace. An alternative to the traditional study abroad experience, the Collaborative Online International Learning (COIL) framework they developed facilitates students' cross-cultural learning and is transferable across disciplines.



Wolf, K. C., & Previti, M. (2023). The pop-up museum: A novel approach to project-based service-learning. *Journal on Excellence in College Teaching*, 34(2), 5-31.

The Pop-Up Museum: A Novel Approach to Project-Based Service-Learning

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This study examines a student-created “pop-up museum” about the opioid epidemic that was part of a project-based service-learning (PBSL) experience in a college course. A survey of student perceptions of the learning experience, a course evaluation, and a survey of museum visitors’ perceptions of their experiences with the museum evaluated key elements of PBSL. Students reported advancements in key elements of PBSL, including subject matter expertise, communication skills, collaboration, critical thinking, and civic engagement. In addition, museum visitors reported increased knowledge about the opioid epidemic. The results suggest that student-created pop-up museums can be rewarding PBSL experiences.

Introduction

Educators seeking to deepen student learning and connect the classroom to the real world have adopted instructional strategies such as project-based learning (PBL) and service-learning (SL). Project-based learning and service-learning are methods of active, experiential learning; in both, students “learn by doing” (Buck Institute for Education, n.d.; Jacoby, 2015; Larmer et al., 2015; Steenhuis & Rowland, 2018). Although the types of problems addressed in PBL are wide-ranging, a defining characteristic of SL is its focus on problems that affect communities

(Bringle & Hatcher, 1996; Jacoby, 2015). Thus, in a course that merges these two learning methods as project-based service-learning (PBSL), students address real problems that affect a community (Bielefeldt et al., 2009).

This article describes a study examining the efficacy of a specific PBSL course design—namely, a course in which students created and hosted a pop-up museum focused on an important public policy issue. The article first provides an overview of project-based learning, service-learning, and pop-up museums. Next, it describes how the pop-up museum was deployed in the subject course, including the course assignments and museum design. Finally, it provides results from a survey of student perceptions of this learning experience, a university course evaluation, and a survey of museum visitor perceptions of their experiences with the museum.

To test the efficacy of the pop-up museum concept in the context of PBSL, the following four research questions were investigated:

RQ 1: How was student motivation to learn affected by the PBSL and pop-up museum course design?

RQ 2: What did students find rewarding about their PBSL and pop-up museum experience?

RQ 3: To what extent did students report experiencing key elements of PBSL through participation in the pop-up museum project?

RQ 4: How did the pop-up museum affect museum visitors' perceptions of their awareness and knowledge about an important societal issue?

Literature Review

Project-Based Learning and Service-Learning

Although numerous definitions and permutations of both PBL and SL are found in the literature, there are generally agreed upon elements of each. One widely cited definition of PBL describes it as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (Markham et al., 2003, p. 4). The authentic question or problem is the heart of the project; it is the motivating question for the

project (Guo et al., 2020; Krajcik & Blumenfeld, 2006; Thomas, 2000). Students attain key knowledge about the question or problem through traditional classroom methods, such as lectures and reading, but they also actively construct their own knowledge about the problem through other means, such as discussion, research, and interaction with those working in the field or affected by the problem (Thomas, 2000). Students demonstrate agency as they plan and develop their projects, provide and receive constructive feedback, and revise their work. They then present the completed project to a public audience and reflect on their learning (Larmer et al., 2015). Through their work, students meet essential PBL learning outcomes as they attain the following skills: (1) key content knowledge, (2) an understanding of how to apply that knowledge to solve problems, and (3) skills such as critical thinking, problem solving, collaboration, and project management (Larmer & Mergendoller, 2010).

SL, like PBL, aims to deepen student knowledge and skill development through experiential learning, but the experience focuses on a service activity rather than a project. In SL, “students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility” (Bringle & Hatcher, 1996, p. 5). Students build upon foundational knowledge as they provide direct or indirect service to address a community concern (Eyler & Giles, 1999; Jacoby, 2015). As in PBL, student reflection, defined as “the intentional consideration of experience in light of particular learning objectives” (Hatcher & Bringle, 1997, p. 153), is a critical component of SL, as it prompts students to identify and evaluate community needs and their own ability and role in meeting those needs (Jacoby, 2015).

Pop-Up Museums as PBSL

According to Giordano (2013), “the Pop-Up Museum could be considered as a short-term institution, mobile museum or outdoor exhibit, created outside the confines of its traditional location, in existing temporary and unexpected places, with strong community anchors and the aim of enhancing civic engagement” (p. 462).¹ Common features of pop-up museums include their temporary nature, their location beyond traditional museum galleries, and their intentional engagement with the community (Charr, 2021; Giordano, 2013). Originally used by traditional museums to broaden their audience (Merritt, 2010), this

unique approach to exhibits has been embraced by curators across the United States, including special exhibitions by the Metropolitan Museum of Art (Metropolitan Museum of Art, 2021) and an immersive Van Gogh Experience in San Francisco (Immersive Van Gogh San Francisco, 2021). Educators have recently incorporated pop-up museums into their courses, providing unique learning opportunities for students. For example, students created a pop-up museum on medieval history at Ohio Wesleyan University (Arnold, 2015). Educators in secondary schools have also woven the pop-up museum educational strategy into curricula, leading to student-created and hosted museums on topics such as Black history (Jones, 2020), the modern Middle East (Portland Public Schools, 2015), and genocide (Armenpress, 2013). Thus, “pop-ups” have emerged as a common feature of the museum industry and present intriguing learning opportunities for students in higher education.

Examining the Efficacy of a Pop-Up Museum Assignment in a College Course

Pop-up museums potentially present a unique opportunity for PBSL in undergraduate courses. The issue or problem addressed in the curriculum can serve as the motivating or authentic question for the project and the theme for the museum. The process of creating the museum content becomes the “project” for PBL and the “service activity” for SL as students work to first educate themselves and then others about the topic. Likewise, the experiential and interactive aspects of PBL and SL can be achieved as students prepare the museum content and interact with museum visitors. The temporary and space-flexible nature of the pop-up museum makes it possible to accomplish within a semester.

Method

This post-test, one group, mixed-method study included three surveys with scaled and open-ended items. Because the study sought to evaluate an experimental PBSL learning intervention that took place over the course of a semester in a new course offering, this study design was chosen based on feasibility. In these contexts, student self-report data are commonly used to assess pedagogical approaches, although the results are not as valid as other measures (Garnjost &

Lawter, 2019). The university's institutional review board approved the study via expedited review as it posed little-to-no risk for participants.

*Instructional Intervention:
A Pop-Up Museum on the Opioid Epidemic*

The efficacy of using a pop-up museum concept as a PBSL opportunity was tested in a multidisciplinary undergraduate seminar course on drug epidemics taught in fall 2019 at a regional state university. The course itself examined drug epidemics in the American context through an interdisciplinary lens, including history, public health, criminal justice, neuroscience, law, and public policy. Twenty-four upper-level undergraduate students with a variety of majors were enrolled in the course and took part in the pop-up museum project. The students were tasked with creating a pop-up museum on the ongoing opioid epidemic, which began around the turn of the millennium in the U.S. and has claimed approximately 500,000 lives through overdose deaths between 1999 and 2020 (Centers for Disease Control and Prevention, 2021).

The major assignments in the course challenged students to create content for the pop-up museum that mimicked features of more traditional museums. For example, each student was tasked with identifying and providing a brief description of two museum "artifacts" that could help tell the story of the opioid epidemic. The artifacts chosen included objects, pictures, and other items, such as Narcan nasal spray, a reprint of a 19th-century pharmaceutical advertisement for a product that contained heroin, and a tee shirt that commemorated the life of a teenager who had died of an opioid overdose. Visitors to the opioid epidemic pop-up museum could see and hold these objects and read their descriptions as they walked through the museum, much like they would interact with artifacts in a traditional museum.

The students also wrote narratives about people directly involved in the opioid epidemic, including friends, family, and celebrities who have struggled with opioid use disorders as well as prominent policy makers and professionals in the healthcare industry. Visitors to the museum were each randomly assigned one of the individuals affected by the epidemic as they entered the museum and learned more about the subject's life incrementally as they progressed through the exhibits. This approach was meant to mimic similar experiences found at more traditional museums such as the United States Holocaust Memorial Museum, where visitors are given an identification card of

a person who experienced the Holocaust and they learn more about that person's experience as they progress through the museum (United States Holocaust Memorial Council, n.d.). Similarly, visitors to the National Museum of the Civil War Soldier are given an MP3 player to listen to as they walk through the museum and learn about a soldier's experiences in the war as they progress through the exhibits (Pamplin Historical Park, 2021).

Students also worked in teams to create research posters focused on discrete aspects of the opioid epidemic that they presented as visitors walked through the museum. Students selected topics such as the effect of the epidemic on children and families, the neuroscience of opioid addiction, pill mills, safe injection sites, and opioid misuse and addiction among the LGBTQ+ population. Presenting their posters and interacting with the museum visitors as they walked through the exhibits gave students the opportunity to serve as "docents" who could share their expertise with museum visitors.

The creation and presentation of the museum were part of a larger course design that included essential elements of both PBL and SL (see Table 1 and italicized terms below). Key *foundational knowledge* (PBL & SL) about the epidemic was obtained through readings, lectures, and class discussions. Instructors provided *scaffolds and resources* (PBL) for additional learning through films, podcasts, and guest speakers.

Building upon this foundational knowledge, students independently researched the opioid problem and used their *constructed knowledge* (PBL) to develop content for the museum. This process of content development can be viewed as *indirect service* (SL), as the students worked behind the scenes to become educated on the topic so they could educate the public. *Direct service* (SL) was integrated with the curriculum as the museum opened to the public. As they hosted the museum, students made presentations of their projects to an *authentic audience* (PBL). In doing so, they shared their acquired foundational and constructed knowledge and also refined their thinking through discussions with museum visitors. Once the museum closed, students engaged in a *reflection* (PBL and SL) on their service project.

Instruments, Procedures for Data Collection, and Data Analysis

The researchers utilized three data sets to answer the research questions: a survey of students in the subject course, IDEA Student Rating System (university course evaluation instrument) survey results from the subject course, and a survey of the pop-up museum visitors. The three surveys included both closed- and open-ended items.

Table 1
Elements of PBSL in the Subject Course

<i>Project-Based Learning</i>	<i>Service-Learning</i>	<i>Course</i>
Key knowledge (Boss & Larmer, 2018)	Foundational knowledge (Eyler & Giles, 1999; Jacoby, 2015)	Lectures
Driving question to motivate learning (Boss & Larmer, 2018; Thomas, 2000)		Readings
Scaffolds and resources (Grant, 2002)		Films
		Podcasts
		Discussions
		Guest Speakers
Constructed knowledge (Thomas, 2000)	Indirect service integrated with curriculum (Connor-Linton, 1995; Jacoby, 2015)	Artifacts
Creation of artifacts (Krajcik & Shin, 2014)		Research Posters
		Narratives
		Museum Planning
Critique & Revision (Larmer et al., 2015)		Peer Edits
		Instructor Feedback
Present product to authentic audience (Larmer et al., 2015)	Direct service integrated with curriculum (Jacoby, 2015)	Presentation of Pop-Up Museum
Reflection (Grant, 2002; Larmer et al., 2015)	Reflection (Bringle & Hatcher, 2002; Camus et al., 2021).	Reflection Assignments

Student Survey

The student survey consisted of 16 items: 8 closed-ended questions with scaled responses and 8 open-ended questions that sought narrative responses. The closed-ended questions asked student respondents to indicate the extent to which they agreed with various statements about their experiences in the course and working on the pop-up museum using Likert-style scaled responses from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). For example, one question focused on students' motivation to learn, asking them the extent to which they agreed with this statement: "Presenting my poster, narrative, and artifacts to the campus community in the museum motivated me to produce a better work product." Other questions focused on students' perceptions of learning, asking whether they agreed with statements about improvement of their subject matter knowledge, communication, and collaboration. For the closed-ended Likert-scale questions, student responses were analyzed using frequency distributions. The mean and median were also calculated for each item because the responses did not follow a normal distribution.

The open-ended survey questions asked students to reflect upon their learning experiences. Conceptual content analysis (Krippendorff, 2019) was performed by the researchers to highlight common themes in the students' narrative responses. The open-ended answers were coded for concept frequency to identify themes related to PBSL.

The student survey was administered to all students in the course during the final class meeting of the semester after the pop-up museum project was completed. Twenty-two out of 24 of the students in the course agreed to respond to the survey (91.7% response rate), although some respondents did not answer all of the survey questions.

IDEA Student Ratings Survey

Data were also gathered from the IDEA Student Rating System (IDEA, 2021), which is the course evaluation student survey used at the university where the subject course was taught. The survey consisted of 40 closed-ended Likert-scale questions and one open-ended question that asked for student comments on the course. Most relevant to this research study, the survey asked students to rate the progress they had made on various types of learning, some of which were directly related to elements of PBSL. A 5-point Likert scale from 1 (*No Apparent Progress*) to 5 (*Exceptional Progress*) was used for items rating students' "learning to apply course material (to improve thinking, problem solving, and decisions)"; "learning to analyze and critically evaluate ideas, arguments,

and points of view”; and “learning to apply knowledge and skills to benefit others or serve the public good” (Fleck et al., 2017; LeChausser, 2020). Other relevant closed-ended questions asked students to rate how often the instructors used certain “teaching procedures” that are relevant to PBSL, such as “creat[ing] opportunities for students to apply course content outside the classroom”; “involv[ing] students in hands-on projects such as research, case studies, or real-life activities”; and “[giving] projects, tests, or assignments that required original or creative thinking” (Eyler, & Giles, 1999; Larmer & Mergendoller, 2010). These questions used a 5-point Likert scale from 1 (*Hardly Ever*) to 5 (*Almost Always*). Student responses were analyzed using frequency distributions. The mean and median were also calculated for each item because the responses did not follow a normal distribution.

The survey was administered online via an online course evaluation system toward the end of the semester in the subject course. The survey was available for 14 days, and students were given time during class to complete the survey on their computers or smartphones to increase the response rate. Twenty-two out of 24 students enrolled in the course at the end of the semester completed the survey (91.7% response rate).

Museum Visitor Survey

The museum visitor survey consisted of 28 closed-ended 5-point Likert-scale items and one open-ended question seeking additional comments on the visitors’ pop-up museum experience. The survey asked visitors to rate their perceptions of how the pop-up museum affected them, including whether it promoted awareness and understanding of different aspects of the opioid epidemic, whether it increased their knowledge of the epidemic, and whether they supported certain strategies for addressing the epidemic. Most relevant to this study, five of the closed-ended questions sought students’ responses to whether the pop-up museum “effectively promoted awareness and understanding of” various aspects of the opioid epidemic, from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). A sixth closed-ended Likert-scale question asked more broadly whether the museum “increased [visitor’s] knowledge about the Opioid Epidemic.” Because a 5-point Likert scale was used for the closed-ended questions, responses were analyzed using frequency distributions. The mean and median were also calculated for each item because the responses did not follow a normal distribution.

The survey of the pop-up museum visitors was administered to visitors as they exited the museum using Qualtrics software on elec-

tronic tablets. Eighty-nine out of 262 visitors completed the museum visitors survey (34.0% response rate).

Results

Student Motivation to Learn

The study's first research question (RQ1) was, "How was student motivation to learn affected by the PBSL and pop-up museum experience?" Most students (95%) reported they were motivated to produce a better work product knowing they would be presenting to the campus community. Results for the question associated with RQ1 can be found in Table 2. These responses were supported by qualitative student responses in the survey, with 28.6% of students indicating that the museum project provided them additional motivation. For example, one student commented, "Presenting to the public made me work harder to provide the most accurate information and explain the information more thoroughly." Another student wrote, "In the museum it was kind of 'game on.' We had to know our stuff in order to get the important stuff out." This was further supported by student responses to the IDEA course evaluation survey, where 77% of student respondents indicated that the course instructors "almost always" "[s]timulated students to intellectual effort beyond that required by most courses" (see Table 3).

Perceived Rewards

The second research question (RQ2) was, "What did students find rewarding about their PBSL and pop-up museum experience?" Content analysis of the student responses identified four common themes. The most frequent theme was the opportunity to interact with the public (41%). Several students also noted they valued the opportunities to educate (36%) and to raise awareness about an important topic (23%). For example, one student commented that the most rewarding aspect of the experience was "being able to share the knowledge I gained on the opioid epidemic with others. Spreading awareness [sic]." Another student added, "When explaining our poster to others, I found it rewarding when they would say they learn [sic] something new." Another student valued "being able to inform more people about this issue in an open dialogue." Similar student comments included, "I found that the most rewarding thing was seeing how much the community enjoyed and learned from the museum," and "I loved the narratives and how

Table 2
Student Survey Responses

	<i>Strongly Disagree (1)</i>	<i>Somewhat Disagree (2)</i>	<i>Somewhat Agree (3)</i>	<i>Strongly Agree (4)</i>	<i>Median</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N (%)</i>
Motivation to Learn								
<i>Prompt</i>								
Presenting my poster, narrative, and artifacts to the campus community in the museum motivated me to produce better work product.	1 (4.5%)	0 (0%)	3 (14.3%)	17 (81.0%)	4	3.7	0.72	21 (95.5%)
Subject Matter Knowledge								
By working on the museum project, I developed expertise in different aspects of the opioid epidemic.	1 (4.5%)	0 (0%)	1 (4.5%)	20 (90.1%)	4	3.8	0.66	22 (100%)

Table 2 (continued)

Student Survey Responses

	<i>Strongly Disagree (1)</i>	<i>Somewhat Disagree (2)</i>	<i>Somewhat Agree (3)</i>	<i>Strongly Agree (4)</i>	<i>Median</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N (%)</i>
Communi- cation								
<i>Prompt</i>								
Presenting my work to the community through the museum display enhanced my ability to communicate and share information with students and professionals from other disciplines.	1 (4.5%)	0 (0%)	2 (9%)	19 (86.4%)	4	3.8	0.69	22 (100%)
Collabor- ation								
<i>Prompt</i>								
Our work preparing and presenting the museum display enabled me to learn about, from, and with others as we collaborated to teach others about the opioid epidemic.	1 (4.5%)	0 (0%)	3 (14.3%)	17 (81.0%)	4	3.7	0.72	21 (95.5%)

Table 3
IDEA Evaluation Responses on Instructor Teaching Procedures: Elements of PBSL

	Hardly Ever (1)	Occasionally (2)	Sometimes (3)	Frequently (4)	Almost Always (5)	Mean	Standard Deviation	N (%)
<i>Prompt: Describe the frequency of your instructor's teaching procedures.</i>								
Motiva- tion	0 (0%)	1 (4.6%)	2 (9.1%)	2 (9.1%)	17 (77.3%)	5	.83	22 (100%)
	Stimulated students to intellectual effort beyond that required by most courses							
Critical Thinking	0 (0%)	0 (0%)	0 (0%)	5 (22.7%)	17 (77.3%)	5	0.42	22 (100%)
	Gave projects, tests, or assignments that required original or creative thinking							

strangers were able to read the personal stories of those affected by the opioid epidemic and appreciate its importance.”

Some of the student responses also echoed the results of the Likert-scale questions reported above. For example, one student commented, “After I would explain my poster they would compliment me on my ability to speak all the information [sic] which was rewarding because before this experience I hated speaking in front of a classroom of people.”

Elements of PBSL

The third research question (RQ3) was, “To what extent did students report experiencing key elements of PBSL through participation in the pop-up museum project?” Almost all students reported favorably on all tested outcomes—subject matter expertise, communication, collaboration, critical thinking, and civic engagement.

In the student survey, students reported developing subject matter knowledge (95%) and improved competency in the skills of communication (95%) and collaboration (91%). Results from the student survey for the questions associated with RQ2 can be found in Table 2. These results are also supported by the student responses to the end-of-semester IDEA course evaluation survey, which are reported in Tables 3 and 4. On that survey, 91% of students reported “substantial” or “exceptional progress” on “gaining a basic understanding of the subject.” This finding supports the subject matter knowledge results reported above. In alignment with the communication skills results reported above, 86% of students reported substantial or exceptional progress on “developing skill in expressing myself orally or in writing.” Improvement in the skill of collaboration was also supported in the IDEA survey results, with 95% of students reporting substantial or exceptional progress on “acquiring skills in working with others as a member of a team.”

The IDEA course evaluations also tested students’ experiences with critical thinking and civic engagement. All students (100%) indicated that “almost always” or “frequently” the course “gave projects, tests, or assignments that required original or creative thinking” In addition, 95% of students reported substantial or exceptional progress on “learning to apply course material (to improve thinking, problem solving, and decisions),” and 91% of students reported substantial or exceptional progress on “learning to analyze and critically evaluate ideas, arguments, and points of view.” Progress on civic engagement

Table 4
IDEA Evaluation Responses on Student Progress: Elements of PBSL

	No Apparent Progress (1)	Slight Progress (2)	Moderate Progress (3)	Substantial Progress (4)	Exceptional Progress (5)	Median	Mean	Standard Deviation	N (%)
<i>Prompt:</i> <i>Describe your progress on:</i>									
Subject Matter Knowledge Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)	0 (0%)	1 (4.6%)	0 (0%)	3 (13.6%)	18 (81.8%)	5	4.73	0.69	22 (100%)
Communication Developing skill in expressing myself orally or in writing	1 (4.6%)	1 (4.6%)	1 (4.6%)	4 (18.2%)	15 (68.2%)	5	4.41	1.07	22 (100%)
Collaboration Acquiring skills in working with others as a member of a team	1 (4.6%)	0 (0%)	0 (0%)	5 (22.7%)	15 (63.6%)	5	4.59	0.89	22 (100%)

Critical Thinking	Learning to <i>apply</i> course material (to improve thinking, problem solving, and decisions)	1 (4.6%)	0 (0%)	0 (0%)	4 (18.2%)	17 (77.3%)	5	4.64	0.88	22 (100%)
Civic Engagement	Learning to apply knowledge and skills to benefit others or serve the public good	0 (0%)	1 (4.6%)	0 (0%)	6 (27.3%)	15 (68.2%)	5	4.59	0.72	22 (100%)

was also supported by student responses on the IDEA survey, with 95% of students reporting substantial or exceptional progress on “learning to apply knowledge and skills to benefit others or serve the public good.” All students who responded also indicated that the instructors frequently or almost always “involved students in hands-on projects such as research, case studies, or real-life activities.” Eighty-six percent of students indicated that the instructors frequently or almost always “created opportunities for students to apply course content outside the classroom.”

Public Benefit

The fourth research question (RQ4) was, “How did the pop-up museum affect museum visitors’ perceptions of their awareness and knowledge about an important societal issue?” A key feature of PBSL courses is producing some form of public benefit. The pop-up museum project in the subject course was designed to educate the community about the opioid epidemic. The visitor survey contained six items that measured the museum’s effect on the public’s perceived knowledge of the epidemic. The survey asked whether “Information provided in the display increased [visitors’] knowledge about the Opioid Epidemic.” In response, 95% of the surveyed visitors reported an increase in their knowledge about the epidemic.

Respondents similarly reported learning about specific aspects of the epidemic. Most respondents agreed that the museum “effectively promoted awareness and understanding of” “causes of the epidemic” (94%), “prevention of opioid disorders” (91%), “treatment and recovery options” (94%), “methods to reduce harm caused by the epidemic” (93%), and “alternative approaches to drug regulation” (94%). The responses to RQ4 can be found in Table 5.

Discussion

The study results showed that linking a pop-up museum with PBSL yields positive results in terms of student motivation to learn and student perceptions of PBSL elements. Although motivation to learn is extremely important in any course, it is paramount in a PBSL course, which, by design, requires students to construct knowledge actively (Fleck et al., 2017). The study findings suggest that adding the pop-up museum to the PBSL course positively impacted motivation because students knew they would be required to use their knowledge to create

Table 5 (continued)
Museum Visitor Survey Results

	Strongly Disagree (3)	Somewhat Disagree (4)	Neither Agree nor Disagree (5)	Somewhat Agree (6)	Strongly Agree (7)	
Prompt: The Opioid Epidemic display effectively promoted awareness and understanding of:						
• Causes of the opioid epidemic	5 (5.6%)	0 (0%)	0 (0%)	5 (5.6%)	79 (88.8%)	5 4.72 89 (100%) 0.94
• Prevention of opioid use disorders	5 (5.8%)	0 (0%)	3 (3.5%)	15 (17.4%)	63 (73.3%)	5 4.52 86 (96.6%) 1.01
• Treatment and recovery options	4 (4.5%)	0 (0%)	1 (1.1%)	14 (15.9%)	69 (78.4%)	5 4.63 88 (98.9%) 0.90
• Methods to reduce harm caused by the epidemic	4 (4.7%)	0 (0%)	2 (2.3%)	7 (8.1%)	73 (84.9%)	5 4.69 86 (96.6%) 0.91
• Alternative approaches to drug regulation	4 (4.7%)	0 (0%)	1 (1.2%)	15 (17.4%)	66 (76.7%)	5 4.62 86 (96.6%) 0.91

and curate information for a large public audience with whom they would be interacting on a one-on-one basis.

In prior studies, PBL and SL courses have also been found to impact student learning positively (see, for instance, Brescia et al., 2009; Garnjost & Lawter, 2019; Kim & Lee, 2018). Given these studies and the finding that 95% of students who participated in the pop-up museum reported high levels of motivation, it is not surprising also to find that students reported high levels of achievement related to key elements of PBSL. For example, both the student survey and IDEA survey results indicated that the students felt they had gained subject matter expertise. While the validity of self-assessed knowledge can be questioned (Kruger & Dunning, 1999), the students' responses are bolstered by the fact that students showcased their knowledge in the museum, and almost all surveyed museum visitors reported an increase in their knowledge due to information in the student displays.

The student survey results also indicated that students felt they had achieved several other elements of PBSL. For example, almost all students reported progress on their communication skills. This likely resulted from the public nature of the museum that required them to interact with members of the community. Likewise, most students reported progress on critical thinking, collaboration, and civic engagement skills while preparing and hosting the museum. The very favorable self-assessments of these skills, which are believed to be essential to student success in and beyond college, confirm the value of linking a pop-up museum with PBSL.

The students' qualitative responses in the student survey further indicated that the pop-up museum was a positive learning experience. In responses to a question about the most rewarding aspects of the museum, several students pointed to their interactions with the public and the opportunity to educate others and spread awareness about an important topic as rewarding aspects of the experience. This demonstrates that the opportunity to provide a service to the community was an essential aspect of the course that contributed to the positive student experience.

The survey results also suggest that the pop-up museum project achieved the important PBSL element of educating the public about an important societal issue. Ninety-five percent of surveyed museum visitors reported an increase in their knowledge. This finding supports the notion that linking a pop-up museum with a PBSL course can leverage student learning beyond the classroom and into the community.

Limitations

The results of this study are limited because the design was pre-experimental, post-test only, and with no comparison group. Therefore, future evaluations of the pop-up museum instructional strategy would benefit from the inclusions of pre-tests and comparison groups, if possible. This will significantly strengthen conclusions about the museum's effect on student learning.

Additionally, each of the survey instruments administered has certain important limitations, and the results should be viewed accordingly. Most important, the survey questions gathered data on student perceptions and did not measure actual learning achievement. Regarding the survey of students who participated in the subject course, there are also concerns about the reliability of the student responses. There is a robust discussion in the literature about the reliability of students' survey responses, particularly when they are reporting on their learning (Porter, 2011). Students may not be accurate judges of their learning progress, and their responses can be tainted by social desirability bias, for example (Bowman & Hill, 2011). Likewise, the data from the IDEA student ratings also have limitations. There is a wealth of literature critiquing the validity of student evaluations of teaching, which can be tainted by sexism, prejudice, and class size, among other factors (Esaray & Valdes, 2020; Uttl et al., 2017). While student surveys remain an accepted method for measuring student learning (Wright & Jenkins-Guarnieri, 2012), they are imperfect instruments.

For the pop-up museum visitor survey, the responses cannot be assumed to be representative, and the results may be affected by voluntary response bias. Because completion of the survey was voluntary, and demographic and other information were not gathered on all museum visitors, it was not possible to ensure that the survey respondents constituted a representative sample of those who attended the museum. Therefore, the results are not generalizable to all who attended. Additionally, these surveys also gathered the respondents' perceptions of what they had gained from visiting the museum rather than measuring their actual learning.

Conclusions

Pop-up museums provide educators and students with a new and unique opportunity for PBSL focused on topics of community concern. Educators and students can leverage their learning for the public

good as the museum serves as a catalyst for community learning and discussion.

Pop-up museums are effective project-based, service-learning opportunities for college courses. They can be created and delivered within a semester because they are time-limited, they can be set up in public spaces on college campuses because they are space flexible, and they can explore a wide range of contemporary concerns of students and the community alike, such as climate change, health disparities, and social justice. Furthermore, results from this study indicate that creating a pop-up museum in a college course can provide a robust PBSL opportunity for students. Students in the subject course reported that creating and hosting the pop-up museum motivated them to learn and have meaningful engagement with several PBSL elements.

Footnotes

¹Notably, pop-up museums do not qualify as “museums” according to some definitions. For example, the International Council of Museums definition, which indicates that a museum must be a “permanent institution” (ICOM, 2022), would not include pop-ups. However, there is debate in the museum field over whether this definition is too rigid (see, for example, Giordano, 2013; International Council on Museums [ICOM], 2021, p. 54), and alternative definitions that do not require permanence exist (see, for example, Museums Association, 2020). Additionally, the notion of pop-up museums has been embraced by some prominent museums in the United States, and, therefore, the authors feel the use of the term is appropriate here.

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