Trash to Treasure: Experimental Pedagogy Using the Everyday

Katie V. Kirakosian
Professor, Kaplan University
&
Adjunct Faculty, Eastern Connecticut State University
United States of America

Keywords: Pedagogy, Archaeology, Modern

The results of an experimental archaeology laboratory project are presented here, which was taught in-person here in 2011, 2012 and 2013. Paying homage to Rathje and Murphy (2001), each group of students investigated modern refuse by analyzing the contents of vacuum bags, which were donated by members of the Eastern Connecticut State University (ECSU) community. The learning outcomes, laboratory methodology, logistics, student feedback and instructor reflections are presented here as well.

Foreword

In the fall of 2011, I introduced a semester long laboratory project for the first time to two sections of Introduction to Archaeology at Eastern Connecticut State University (Eastern) in the hopes of simulating a true archaeological field experience. After using this lab exercise three semesters in a row, my goal is to outline this project in enough detail so that instructors of archaeology can easily implement this project in their courses, while inspiring social science educators more broadly to support creative, real-life, hands-on, in-class activities.

I had been inspired to use vacuum bags some months before, when conducting interviews for my dissertation. One interviewee recalled a similar class that he taught decades before, where students were asked to design their own independent projects, which had to use an archaeological theory or method in their everyday lives. He recalled that one student vacuumed her house and analyzed the contents to talk about activity areas. I was intrigued by the idea of using vacuum bags as a proxy for an archaeological site. For months I thought about whether I might do just this. I did have concerns though. How could I ensure safety? Would half of the class drop on the first day after I introduced this lab? Would they really learn anything about archaeology through this process? What might the ethical challenges be?

After getting positive feedback from a colleague in my department, I emailed the Eastern community to solicit vacuum bags, as I knew I would need a great deal of support in order to make this work. The email went out in May 2011 and by the time the project began in September; I had met my goal of 25 vacuum bags, or one bag for every two students.

The assignment

This lab project did not actually begin until September 30th, after a full month of textbook reading assignments and lectures (Kelly and Thomas 2009). Students were also reading Rubbish! The Archaeology of Garbage (Rathje and Murphy 2001) and had just had their first discussion a week prior. Having talked about this project for a month with students, they were ready and anxious to "enter the field".

Students were expected to excavate at least 20 cm of their site within five 50-minute lab periods. Although an aggressive expectation in hindsight, they knew they would not be penalized if they did not reach this goal as long as they were working steadily each lab period. While excavating, they had to fill out level forms as well as tags and keep a record of every bag. When I introduced this project to the class, I also explained that their lab portfolios would be graded at the end of the semester and that each student would be expected to present their results to the class with a final poster. Overall this project (lab portfolio and poster) amounted to 40% of a student's total class grade.

Logistics

Having taught several archaeological field schools, I had experienced many logistical challenges. This project however, was different in many ways. As I collected bags, I gave each a unique number and any information that was offered about the household or location was entered into a separate Excel sheet. Many vacuum bags came from individual households, although some sites were actually from a "community vacuum" in one of Eastern's dormitories.

There were 50 students between two classes, which met for 50 minutes in back to back time slots three times a week. Instead of thinking carefully about how to get the students back and forth to the site, I had to consider how to get the sites themselves back and forth to the classroom. Luckily the ECSU campus is relatively small because I had to bring 13 boxes of material back and forth to each lab class. Unfortunately there was no secure storage area in the classroom. In addition to the vacuum bags themselves, many supplies were needed. I had purchased enough gloves, masks, hand sanitizer, paper towels and disinfectant for the whole class to use. I also purchased 60 three-ring folders (which I found for 10 cents a piece), a dozen inexpensive sieves, pairs of scissors and magnifying glasses as well (see Figure 1). Considering the tight budget, I made tweezers out of drink stirrers, folded paper and elastic bands. I was however quite fortunate to borrow a digital scale, microscope and protective eyewear from the Biology Department. Each student was expected to purchase a box of plastic bags that could zip closed and bring them to each lab class. As with all sites on which I have worked, no artifacts or paperwork could be taken home.

If students missed one of the five lab classes, they were expected to make up two hours of lab work. Luckily I was able to book our classroom from 1-4pm on all lab and discussion days. The normally scheduled classes ran from 11-11:50am and 12-12:50pm, after which time students could come in and work on their site independently. Many students wanted to come in who did not have to make up time as well. These extra hours were much quieter than their normally scheduled lab time and students had uninterrupted access to the scale, which was always busy.

Lab reflections

The first month

Things went quite well the first day. The main goal was to introduce the project, "pit partners" and sites. Very few teams actually excavated anything this first day, as many had to stop and clean up soon after they opened their site. Every site was opened however and beginning depths were established (see Figure 2). I encouraged them to use all of their senses (except taste of course) to describe their site. Many did not hold back when describing their site's smell, which many could still detect through their mask slightly. According to their descriptions, many sites smelled like dogs and/or cats, while one vacuum bag smelled like "old people" according to one group although I challenged this last group to be more explicit.

After one group opened their vacuum bag, they called me over to help them interpret what they were seeing (see Figure 3). After some consideration, I realized that vacuum bags apparently do not conform to the Law of Superposition as I had assumed, which states that the oldest materials are in the lower levels of a site, while younger layers accumulate on top. This was a teachable moment, so I stopped the class and explained what I thought I was seeing. It appeared as though vacuum bags accumulate from the outside in, meaning that the layers closest to the outside of the bag are the oldest and those towards the center of the bag are the most recent. Realizing that it would be nearly impossible to have students excavate their sites in this fashion, they continued as planned.

As with many aspects of this assignment, the steps that students went through were the same, but *how* to accomplish a step was rather different. For example, I knew that students would have to close their site at the end of the lab period, just like a unit/site needs to be closed every day. Closing a vacuum bag site however, required newspaper and tape. In order to help with the "reopening" process, I had students write "top" on the top of their site, which is something that I would never require in the field.

The second month

Students still needed a bit of encouragement and guidance about how to open their sites and what their goals were for the second lab, but by the third lab they began to open and close their site independently. They started reflecting on the significance of certain finds and how to interpret their data. Students grappled with lots of topics during this time, as did I.

One student was particularly disgusted by his site and commented quite often about how dirty everything was (implying that the site was made by dirty people). I told him that the point of vacuuming was to get as much dirt out of a space as possible, so might his site imply the opposite: that the people who created this site were very thorough cleaners and did not accept dirt in their house (see Figure 4)? As every lab portfolio contained the Society for American Archaeology's Principals of Archaeological Ethics, I urged him to think about the ethical implications of his work. Was he being ethically responsible and sensitive if one of his main conclusions focused on his site's "dirtiness"? There was a very real possibility that some of those who donated their vacuum bags might come to the final poster presentations, so I was quite concerned about these potential interactions. I had discussed the importance of collaboration and commitment to descendant communities and reasoned with students that this project had similar parallels.

I found myself in weekly conversations that would have been unbelievable to me before starting this project. For example, I soon realized that I would have to add a category of "fingernail" because students started finding many fingernail clippings at some of their sites. I had clearly not thought of it all, as I never anticipated such a category for some reason. After we all recovered from the initial shock (disgust for some) of finding these items, students became interested in their research potential. I had recently announced to the whole class that they had received a grant (although purely fabricated for this project) and had to spend their $800 in grant money, so the research potential of fingernails was exciting to many. They asked me if they could potentially do genetic profiles on fingernails? Could they determine race, or sex? Could they determine an individuals diet? Having no experience and little knowledge in this area, I had to turn to other sources to answer them. I had certainly never found a fingernail in the field!

The discovery of a painted fingernail clipping led to noteworthy conversations about gender norms. Students thought this was irrefutable proof that it was a woman's nail. Can't men paint their nails and isn't that actually the recent trend I asked? But not pink they said. After I pressed them on the issue, no one felt totally confident that it was a woman's nail anymore. As another example, several sites contained large quantities of pine needles. One student thought this was irrefutable proof that the people represented by this vacuum bag celebrated Christmas and were therefore Christian. One Jewish student overheard our conversation and spoke up saying that wreaths and garlands decorate her home during the winter.

Words like "probably" and "likely" frequently entered their comments now. We tried to reason things out together. Question everything I urged. Are there alternative hypotheses for your data? Soon they realized that a piece of long hair could certainly come from a man and the presence of baby wipes did not necessarily mean that a baby lived in the household. I use baby wipes on our dogs I admitted!

The third month

Students started to feel the pressure of their impending poster presentations. Pieces of the lives represented by these vacuum bags started taking shape and fascinating clues began to emerge. One student found parts of a candy necklace and a clothes tag that read 4T (see Figure 5). One group found a used diabetes test strip while another group found dozens of colorful popped balloons.

As I had donated some of my own vacuum bags, I was also interested to see what students were learning about my household, although I never admitted which vacuum bags were mine. Students did not find any fingernails in my vacuum bags, which did not surprise me. I was able to question these students about their evidence and what this might say about variations within human behavior. One student reasoned that perhaps these people do not let their fingernails fall on the floor. How might one dispose of their fingernails otherwise? Maybe they clip them over the trash or the toilet, or they get manicures, or bite their nails.

Interesting discussions ensued for pet owners too. Some students had evidence for dogs based on fur, but no dog claw clippings. We realized that those dogs may go to the groomers or their nails were clipped outside or swept up and put into the trash. One student asked me why they had lots of cat fur but no kibble (see Figure 6). Maybe they feed their cat wet food I proposed. The major consensus was however that vacuum bags only give us a small portion of any story.

Translating the field experience

Some things never change, even if your site is a vacuum bag. One student came up to me after the first lab day admitting that it was hard to balance the excitement of excavating with the drudgery of filling out paperwork (see Figure 7). Some students cleaned up well before it was time and could not wait to be done, while others had to be prodded to stop and others would even work into the next period.

Students called me over to help them identify items, which I am quite used to. What I was not used to was helping students identify things like candy (some disintegrated nearly beyond recognition) and dirty, dried out baby wipes. One thing that I constantly reminded students of was the fact that they were closely connected to much of the material culture they were excavating, which might make the process of identification a bit easier. Would archaeologists in 1,000 years be able to identify small fragments of dozens of candies and other snacks? Perhaps that would be an area of expertise in the future: junkfoodologist.

One thing that was quite helpful was that when lecturing I could draw on student's sites to make certain points throughout much of the semester to keep lecture and lab connected. When talking about subsistence and diet I asked what types of things might one learn if given a trash bag from the same household that has not been determined yet through a vacuum bag, I asked late in the semester? One student suspected that he might have evidence for a baby, but that he might know for sure if he found used diapers or baby food jars or formula canisters. True, but might cloth diapers and breast-feeding still hamper one's argument?

When discussing taphonomy, I had students brainstorm what items from their site would certainly survive 1,000 years and what items likely would not. The class was able to connect to my discussion of cognitive archaeology in ways that no other class had. While discussing cave painting in the Upper Paleolithic, I urged students to consider whether they could discern anything about the thoughts, feelings and mindset of their site's creators. Many thought their sites showed evidence for laziness and/or hurried cleaning--perhaps.

It was hard to not feel defensive when students spoke harshly of my own vacuum bags, so I had to carefully navigate this discussion. Who would vacuum up a whole pencil, one student asked? I had actually vacuumed up that pencil, which had fallen against one of my baseboards. When I heard it clank up my vacuum's hose I was alarmed, but knew if it was anything of value that I could get it back again in the fall. Two other students were perplexed about why someone would vacuum up six whole sheets of toilet paper. That had also been me. When vacuuming one of my bathrooms, my hose actually got caught on the toilet paper roll when I turned around. I wrestled there for some time, after loosing a bit of toilet paper of course!

The final poster presentations

I decided to have each student create their own poster about their site, which was then presented in an open class session during the last week of classes. Pit partners presented their site on the same day and those who were not presenting on a given day were the audience for those who were presenting and vice versa. I made this decision for several reasons. First having each student or even pit partners present their projects one by one would have taken an entire month. Open poster sessions make students engage with each other one on one for an entire class period. Presenters were expected to talk to each audience members (roughly 12-15 students), while audience members were expected to give thoughtful comments and feedback to each presenter (in a small booklet that I made for each student). I walked around during these class periods and talked to students about what they learned from this assignment. Presenters left their posters and comment booklets with me at the end of class, which I then graded and returned to them at their final examination. Secondly, giving each student the freedom to interpret and present their site independently showed them that more than one interpretation was possible. I encouraged them to talk to their pit partner while excavating and discuss what they thought about their site in general, but I was quite clear that they did not have to agree with them about everything—or anything really as long as the data supported their conclusions.

About two weeks before presentation week I emailed the Eastern community again, inviting them to attend the poster sessions. Several members of the community did stop by, including Eastern's president Dr. Elsa M. Núñez. A gentleman who had donated a vacuum bag emailed me beforehand so we could be sure that he came to the session in which his vacuum bag would be presented. The two students who worked on this site were excited to meet him. He confirmed that he had a cat, which they had concluded from the claws, whiskers and fur.

They thought there might also be a fashionable female in the home as evidenced by a hair tie and a single sequin, a compliment that our guest said he would surely share with his wife that evening. They had also both hypothesized that someone in the household fed outdoor birds based on the presence of birdseed, but no feathers. He agreed saying that they often filled their feeder indoors and vacuumed up any spilt seed.

Learning outcomes

Ultimately this project focused on a learning outcome in each of Bloom's (1956) six Taxonomies of Learning (knowledge, comprehension, application, analysis, synthesis and evaluation) in the following ways:

1. Knowledge
    a. Students were able to recognize items recovered from their site.
2. Comprehension
    a. Students were able to specifically identify each item.
3. Application
    a. Students were able to apply weekly concepts to this lab activity, such as the application of relative versus absolute dating techniques, taphonomic processes, sampling strategies and low-level middle-range and high-level theory.
4. Analysis
    a. Students were able to consider various site interpretations from the data they uncovered.
5. Synthesis
    a. Students were able to construct a poster based on the data uncovered and their interpretations.
6. Evaluate
    a. Students were able to present their work to their peers and evaluate the work of others.

Student Feedback

I added several questions to my end-of-the-year evaluations about this project. Nearly every student agreed that this project helped them understand important concepts within archaeology and that this type of project should be continued in future semesters. For their lab portfolios, I had them evaluate their pit partner as well as this project. I asked them to answer the following four questions:

1. How well do you think you both worked together on lab days? Explain.
2. Did your pit partner support you throughout this project? Explain.
3. Did you enjoy the fact that this was a group project, or see the necessity of working in groups of 2 or 3? Explain.
4. Anything else you would like to add?

Many students did comment that they actually wanted/needed more lab time. Students appreciated and depended on their pit partners in general. One student reflected "While I did enjoy working with a partner on this project there was also a need for it. There is no way that I would have been able to do everything by myself in those 5 lab days. I came to realize this on the last day when he wasn't there. Things took me a lot longer and were more difficult when it was just me working on it". Another student said, "When I think 'archaeology' I think getting down and dirty, digging things up. This […] still satisfied the urge to do something hands on and eye opening". Some started out skeptical however, saying "Although I began this project unsure of how much it would relate to archaeology and this class as a whole, it has become clear that this exercise not only relates, but I will go so far to say it is archeology! It ties everything in the course together from the garbology study in Rubbish! to everything we learned from ethics to dating techniques". One student summarized the intent of this project perfectly, saying that it gave "the sense of archaeology as an active enterprise and not just a textbook exercise".

Conclusions

In hindsight I think a series of small changes would have greatly improved the overall experience for students, such as:

- Working in a room with a sink and laboratory style tables. Students in the fall worked in a room that had chairs with attached writing surfaces, making this project difficult at times.
- Working in a room with a lockable storage space. As mentioned previously, I had to bring all the materials back and forth nearly every week, which was a tedious process.

- Having one class period focused entirely on learning how to identify materials as well as how to fill out paperwork. I kept all site data, which would make a class focused on identification and paperwork quite easy to do early in the semester for future classes. Students would see how paperwork is supposed to be filled out and also become familiar with the different types of items that they may encounter.
- Allowing a few more lab days to work on this project. Many students really felt as though the amount of time allotted was just not enough. Although several lectures might have to be abbreviated or deleted entirely, I do believe having more labs would add to the overall experience for students so they do not feel as though they need to rush.
- Having students work in groups of three. Even if I was able to give students more time, working in groups of three is ideal. I did make one group a group of three and they were one of the only group to complete 100 percent of their excavation, which included excavating, identifying, labeling, counting, weighing and logging over 90 bags of material in roughly five hours.
- Consider better ways to keep vacuum bags upright while excavating them. It was very awkward for students to excavate their vacuum bags, especially when they were tall and slender. Most vacuum bags could easily fall over, although we did not necessarily have any accidents. Keeping each site propped up in a shoe box might be ideal, as having one partner simply hold the bag so the other partner can excavate securely does slow down the whole process.

Otherwise, I would definitely continue this lab when teaching Introduction to Archaeology, as I feel it is an accessible way to instill archaeological method and theory. Students were able to relate to and sympathize with my field stories, such as having to dig without a pit partner one day or having to run after my paperwork as a gust of wind blew it all away. By the time the semester ended this group of students had quite a realistic, practical and lasting experience, as did I.

References

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Figure 1. Students focus in on their sites

Figure 2. Students open their sites

Figure 3. Challenging the Law of Superposition

Figure 4. A “dirty” debate

Figure 5. A toddler emerges

Figure 6. A matrix of animal fur