

Lo-tech Tools as Episteme: Rethinking Student Engagement in the Writing Process and Beyond¹

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Abstract:

In this paper, five teacher-scholars describe pedagogical inquiry into the use of 'lo-tech' tools and what we discovered about the affordances of these tools. These include but are not limited to technologies like sticky notes that help students to organize written thoughts and physically move them around, crayons that allow students to highlight, trace, and categorize different types of thoughts on their paper, and index cards that they can use in a variety of interactive ways for their own writing and to write collaboratively. We found that the use of lo-tech tools complemented our work with digital technology, engaging the kinesthetic learners in our classrooms and encouraging a spirit of play in students and teachers alike. We also discuss how teachers can encourage the use of lo-tech tools epistemologically to help students process information, create knowledge, and to come to their own understandings or demonstrate understandings of course content - with no product in mind other than knowledge-making.

Keywords: student engagement, writing process, materiality, affordances, pedagogy, composition, lo-tech, meaning making, play.

Rethinking Student Engagement and Lo-Tech Tools

In recent scholarship on literacy and higher education, especially in the teaching of writing, articles about multimodal composition and the pedagogies that go along with student production of multimodal texts abound. This interest in multimodal composing, combined with increased opportunities for digital composing, has resulted in a 'narrow definition of technology' (Shipka, 2011, p. 20). By confining

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technology to the digital, this notion of multimodal composition has elevated the aural, visual, and oral modes while devaluing the tactile kinesthetic mode or experience of more traditional methods of composing that involved writers in moving from brain to hand to paper. With so much emphasis on digital technology, it is easy to forget that other types of technologies can also be valuable.

In this article, we describe a pedagogical inquiry into the use of 'lo-tech' tools and what we, as teacher-scholars, discovered about their epistemological affordances – that is, the ways in which lo-tech tools can help students make meaning. These tools include but are not limited to large sticky easel paper on which groups of students can write together; small sticky notes that help students to organize ideas and physically move them around; crayons that allow students to draw, trace, and categorize on paper; and index cards that they can use in a variety of interactive ways, individually and collaboratively. We found that the use of lo-tech tools complemented our work with digital technology, engaging the kinesthetic learners in our classrooms and encouraging a spirit of play in students and teachers alike. In this way, we reaffirm the value of the kinesthetic that other scholarship on multimodality has neglected.

To a large extent, our inquiry into the use of lo-tech tools grew out of our commitment as writing instructors to what is called 'process pedagogy.' At its most basic, process pedagogy understands that instructors should 'shift the orientation of learning away from expectations for a final text toward developing the knowledge and abilities needed to produce it' (Anson, 2014, p.217). In lo-tech tools, therefore, we saw an opportunity to increase student engagement in writing as a process. Our inquiry also grew from our belief in the benefits of an interactive teaching style that engages students' multiple intelligences (Gardner, 2000; Griggs, 2010). In the teaching of writing, Miles et al (2001) explore how kinesthetic learners in particular can benefit from the use of tools such as colored blocks and large sheets of paper. Similarly, Flachmann (2013) discusses the benefits of using kinesthetic learning techniques in the classroom, arguing against 'one-size-fits-all linear teaching techniques that do not work well' for many students.

Furthermore, much concern has been expressed recently about the separation of play from learning. Recent studies have shown that the lack of 'free play' in preschool can have long-term detrimental effects on students in their academic engagement (Carlsson-Paige, Almon, McLaughlin, 2015). Play is most often linked with positive engagement between children with their parents, children with their peers, and children with their teachers (Ginsburg, 2007). In higher education, play is 'associated with cognitive, social, and emotional development;' it is considered to be an 'essential aspect of deep learning' and understood to foster 'self-resilience, self-motivation, engagement, and solidarity' (Tarabochia, 2014).

As teachers of writing, we are also interested in the social affordances of lo-tech tools. Our study not only looks at how lo-tech tools can be used in our classrooms, but also investigates the material dimensions, the embodied activity, and social interactions which these tools allow, the 'capabilities and constraints that make possible or limit certain options' (Alexander, 2013). Thus we examine the rhetorical opportunities these tools present through their physical features (e.g., the stickiness of the sticky notes, the colors of the crayons, the movability of the index cards). Like Alexander who teaches students to compile scrapbooks, we argue that lo-tech tools 'allow students with or without technical skills to actively engage the materiality of the composition' and call increased 'attention to the haptic, or tactile, mode.'

Methodology

Our method in conducting this study borrows from grounded theory, in which data collection comes first and a hypothesis is generated from trends and themes organically discovered from the data. We began as a Teaching Circle - a university-sponsored pedagogy discussion group of five instructors (one tenured, two tenure-track, and two graduate student teaching associates) from the English department who all teach required general education writing and literature courses. As part of a small grant program through the Center for Teaching Excellence at our university, our Teaching Circle received just over \$400 to purchase for each of us a set of tools -- large sticky easel pads, boxes of crayons, packages of rainbow colored 5' by 8' index cards, multi-colored liquid highlighters, boxes of colored chalk, and various sizes and colors of sticky notes.

We began with a simple curiosity about what we could do with these lo-tech tools in the face of so many conversations about hi-tech composing. We had chosen these particular tools because we suspected that we could discover ways to use them in our classrooms that would increase students' engagement in the writing process: But now that we had the tools, how would we make use of them? In this way, the tools became a sort of heuristic for us as we played with ideas on how to use them.

To facilitate our own collaboration, we set up a group wiki,² and when one of us used a tool in the classroom, she created a page on the wiki to inform the others of what she had done (in keeping with grounded theory, we did not have a preset list of pages or a preset way of using the tools). On each page, the tool user listed the purpose of her lesson, described what happened, and included any attachments (e.g., assignment sheets, readings, photographs) to help illustrate the activity. At the end of the academic year, these pages included 'drafting,' 'ice breakers,' 'peer review,' 'reflection,' 'review,' 'revising,' and 'sentence level and paragraphs.' Our Teaching Circle also met once a month to discuss our classroom use of the tools and to share ideas and relevant literature.

Using Lo-tech Tools in Our Teaching

Crayons, we found, were an especially useful tool for composing with students in our required general education courses. Unlike keyboard and screen or pen and paper, crayons and a blank sheet of white paper encouraged our students to see composing as an opportunity for play. The vibrant colored crayons in their yellow box were reminiscent of childhood; the feel of the short crayons in students' 18-year-old hands was strange but also familiar. The clean white of the blank sheet of paper was an invitation to begin, kindling the desire to make a mark.

Lynn took advantage of the affordances offered by crayons and paper. She found that she could use this lo-tech tool to foster epistemic thinking, especially when introducing a new topic that she wanted students to explore in terms of their own thoughts and experiences. For example, students were going to write about stress in Lynn's class. On the day brainstorming was to begin, they arrived to find a box of crayons at each seat. Because students sometimes think of college as serious and even boring, a place where one sits passively while attending to a lecture by the teacher, they experienced the crayons as disruptive and immediately wanted to know why the crayons were there and what they would be doing with them.

When Lynn told students she wanted them to draw, some of the class, who had initially picked up and opened the boxes and begun doodling with the crayons inside, became intimidated and put them down. 'I'm not artistic,' they complained. 'I can't draw.' Lynn then reassured the class that they would not need drawing skills in composing with the crayons³. Instead of trying to draw what things look like, Lynn told her students, she wanted them to draw things in a symbolic, abstract way. After drawing for about ten minutes, they would then have an opportunity to share their drawings using the projector and document camera at the front of the room.

After distributing blank printing paper around the room, Lynn gave a quick example on the board to help students get started by drawing her idea of stress using only triangles⁴: a central upside down triangle and then a lot of little triangles of different sizes all around the central one (see Image 1 below). Soon students were picking up the crayons in front of them and beginning to draw. There was laughter and chatter in pairs as they drew. Some students finished quickly, while others continued to embellish their drawings even after the drawing time ending.

² We acknowledge the somewhat ironic situation of using a hi-tech tool to document our experiences using lo-tech tools in our teaching. Nevertheless, a wiki was the best way for us to have access to each other's reflections and to encourage our own collaboration.

³ In fact, a student who saw herself as artistic had difficulty following the directions for this activity.

⁴ The idea of using one geometric shape to represent an abstract idea comes from Lynn's collaboration with artist and teacher Michael Stadler.

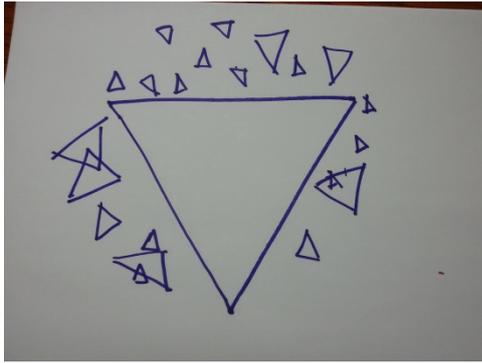


Image 1: Lynn's example drawing for students

When it was time for students to share their creations, they studied each drawing displayed on the screen by way of the projector. Lynn asked the class to interpret what they saw, to engage in actively reading the drawings and how they represented stress. She asked: What does this drawing communicate about stress? What does it seem to want to say about how stress feels?

One student, imitating Lynn's example, shared a drawing of a triangle filled with lots of little squares. 'I think you were trying to say that the stresses are inside your head. Is that why you put the squares inside the triangle?' a student asked the composer of the drawing. Another student volunteered to come to the front of the room and shared a drawing consisting of three even layers of triangles. The triangles were topped with brown and black intensely colored lines pointing upward and there were jagged lines in red and orange, in imitation of a flame, on top of that (see Image 2 below). 'Are the triangles the things that stress you?' 'Are you saying that the stress gets so intense that it's like a fire?' students asked. These guesses were greeted with shy nods of the head at times, but other times with laughter: 'No, that's not it!'



Image 2: Student reflective drawing with crayons.

Drawing with crayons fostered a sense of play among the students in Lynn's classes. Rather than ignoring the embodied, spatial aspects of composing, this activity embraced them, allowing for both kinesthetic learning and social interaction. Furthermore, the use of crayons allowed students to explore meaning with less restraint, encouraging risk taking and exploration.

Oriana also used crayons in her class as tools for their epistemic affordances. In a course wrap-up activity on the last day of classes, Oriana asked students to use crayons to compose visual metaphors of the researched writing process on which the course was focused. This lo-tech activity was in sharp contrast to most of the course's other projects, which had been completed with digital tools in digital formats giving them a fresh context within which to reflect. Furthermore, using crayons to compose visual metaphors was a way of continuing the conversation about the epistemological capabilities of non-alphanumeric texts, which had been ongoing in Oriana's course.

After contextualizing the activity, Oriana offered students two examples of visual metaphors for

researched writing: she drew a stick figure trying to create a sand mandala in strong wind and a second stick figure swimming in the deep end of a pool. Each student then received an 8.5x11' piece of blank white paper and one crayon in a color of their choice to ensure each student had the opportunity to choose different colors. Students worked on their metaphors for about fifteen minutes, intermittently chatting, giggling, getting up for a new crayon color, looking thoughtful, looking quizzical, or looking bored. Oriana then asked ten volunteers to present their visual metaphors to the class.

Not surprisingly, many of the metaphors suggested some level of difficulty with research and frustrations that result from difficult work. One student explained her drawing of a stick figure crossing a finish line labeled 'Final Project Completed' with: 'Research-based writing is like finishing a marathon. It's a long struggle but worth it in the end.' She'd used a red crayon to fill in the 'finish line' ribbon and accentuate the action lines trailing behind the running figure; she'd used yellow for the figure itself. The student explained that she'd chosen red to suggest a desire to reach a goal, and that she had chosen yellow for the runner to suggest her belief in her ability to do so. Another student drew a stick figure inside of a room that was entirely shaded in with black crayon. She explained that she'd wanted to express her difficulty with the research process: 'Research-based writing is like trying to get dressed in a pitch black room.' A third student's used a black crayon to draw a morass of swirling lines to both literally and figuratively signify his frustrations with the research process and his distaste with the result: 'Research-based writing is like my mom's cooking. There is too much of one thing and it always ends up burnt.'

Unlike most digital compositions, these stick figure drawings were created quickly in a face-to-face context where students could see others' reactions to their ideas and emotions in real time. They also received non-verbal and verbal validation from one another: smiles, nods, laughter, and 'Yeps' followed many students' metaphor presentations. Thus, using the crayons allowed for an epistemological experience as well as social interaction in ways that digital composition, in this case, likely would not have.

In addition, because students typically associate the use of crayons with contexts such as primary school art classes or coloring books, their use in a college classroom afforded opportunities to respond more playfully. For the same reason, the crayons also encouraged emotional honesty, and they afforded students the opportunity to engage in epistemic activity while making their communicative choices.

Where crayons afforded play with meaning, sticky notes offered an opportunity to play with arrangement. Using sticky notes allowed students to try out more than one way to order and connect ideas, a process that cut-and-paste features of word-processing programs often makes distracting or difficult, with text often becoming lost, pasted repeatedly, or inserted in haphazard ways.

In Bryna's Basic Writing course, students had been assigned to write a letter to an instructor of a course they'd already taken. In the letter, they were to suggest changes to the course. Initially, the letters the students composed were disjointed, with one paragraph loosely following another, explaining a feature of the course that was problematic and then giving evidence why. Students did not see how they could connect a paragraph on the choice of textbook to one on the way the professor used the online course management system. To help the students learn about arrangement or organization, as well as to teach them how to develop transitions between paragraphs, Bryna developed a tactile kinetic activity using sticky notes. This activity afforded the chance for students to move their ideas around in multiple ways⁵, testing and shaping, and finally choosing the most rhetorically effective way to arrange the content and make their letters coherent and cohesive.

Bryna brought to class two types of sticky notes: 3x3s in bright colors, and 2x1s in pale yellow. All students got a small stack of the yellow, and each student chose his/her own bright color of the 3x3s and received a small stack of those. They then wrote each of their criterion for evaluating the course on a separate 3x3 sticky notes until they eventually had as many sticky notes as they did criteria. Bryna asked students to place the sticky notes in various groupings based on how each criterion might make

⁵ This activity is inspired by a department colleague, Helen Sittler.

their reader feel, sticking them into place on their workspace or computer monitor. Writing groups then offered feedback on the placement of the sticky notes: 'These two are likely to make your professor defensive; perhaps you shouldn't begin with them if you want him to keep reading'; 'Put these together because they are all arguments based on ethos.' The stickiness of the sticky notes afforded students the ability to move their criteria around, categorize, re-order and rearrange.

After students felt confident with their arrangement, they used the smaller yellow sticky notes to work on writing transitions to connect each criterion to the next. In some cases that meant simply writing a transitional word (e.g., 'similarly,' or 'first,' 'second,' and 'third'), and in others it meant creating more of a thread or argument through the use of transitional sentences that more explicitly demonstrated the connections between the paragraphs. On each small sticky note, they wrote a transition. They then stuck the transitions between their large sticky notes that contained the criteria. The movability of the small sticky notes allowed students to alter their placement of transitions while continuing to rearrange their criteria. In the end, students were able to make much more engaged decisions about the arrangement of their paragraphs through the kinesthetic use of the lo-tech tools and through the social interaction of working with their peers with the sticky notes.

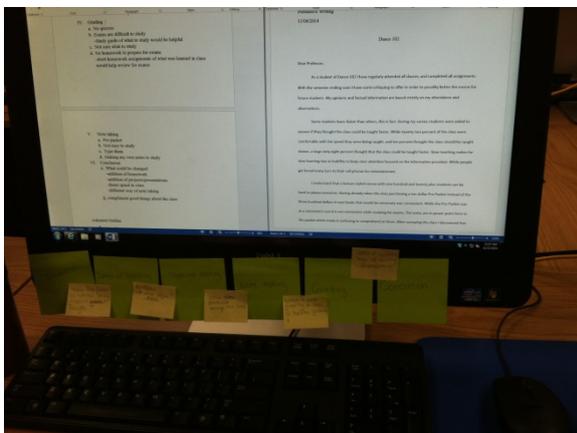


Image 3: Student use of large and small sticky notes in combination with screen work.

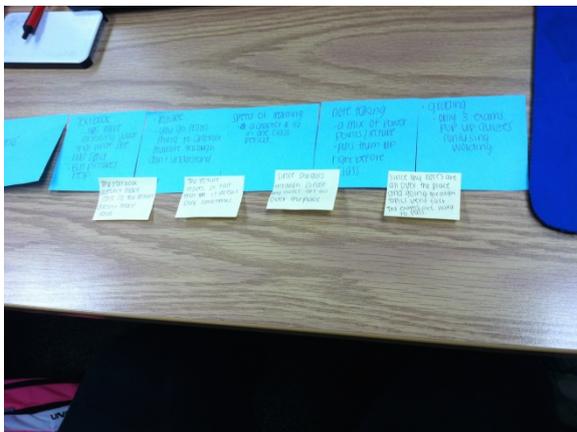


Image 4: Student use of large and small sticky notes.

Index cards also allowed students to make text moveable, and they afforded students the ability to move around the room while composing. Bryna had noticed that the students in her Composition I course were often sleepy (the course met during lunchtime) and sometimes appeared bored. To encourage movement and social interaction while engaging in reflection about their current project, she wrote reflective statements on colored index cards (e.g., 'I feel proud of my project' or 'I wish I had more time to work on my project') and then taped the cards around the walls of the room simulating an art gallery. Students then walked around the room to view each card and were asked to write a statement of their own underneath the one written on the card (e.g., 'I agree' or 'not true for me'). At the same time, they were asked to write in their notebooks the sentences from the cards that most resonated with them. After viewing the cards, students were asked to take the card closest to them off

the wall and bring it back to their desk, and then free-write on how the card's statements related to their reflection on their own project. This was followed by a large group discussion on the reflective statements. Because the index cards were small and portable, students could take them off the wall, carry them back to their seats, and share them with their writing groups if they chose. This afforded a chance for students to move around the room, creating a learning experience that was simultaneously epistemological and kinesthetic.

Our pedagogy group also experimented with the affordances of highlighters. Maha and Rachael took advantage of their set of lo-tech tools by providing highlighters as a way to make visual the various features of written texts. Yellow highlighters have always been popular when it comes to calling attention to important information; however, in Maha's and Rachael's classes, a variety of colors were used so as to allow students to 'code' texts according to their rhetorical and genre features. Maha, in a researched writing course, asked students to highlight genre features in different colors: green for places in the text that established the researcher's ethos, red for places that established the researcher's questions, blue for methods, and orange for the use of sources. The purpose of using highlighters for this activity was to help students better understand primary elements of researched writing – the researcher's ethos, methods of collecting data, descriptions of participants, and methods of analysis – and how to spot them in any text. She brought a text and asked them to read and highlight the elements they thought could be found in most research papers. Using highlighters helped students to locate and code the main elements and sections that they needed to include in their own research papers. Because of their bright colors and transparency, highlighters afforded the ability to visualize the elements of a research paper and how they are interwoven to create a coherent whole.

Similarly, Rachael used highlighters in a way that enabled students to interact physically with texts while considering how writers create coherence. Being able to visualize how writers maintain connections between their points, she felt, would help students to build stronger arguments in their own writing. Rachael began by providing students with a brief lesson on sentence and paragraph level transitions, including the use of transition expressions and the repetition of key words. After the lesson, she divided the class into groups, giving each group a set of highlighters in various colors and two sample research papers. Students were asked to highlight each key word used in the paper in a different color and to highlight transition expressions in yet another color. When they were finished, students had a visual map of the paper that called attention to the ways that ideas were connected. In a discussion following the activity, students demonstrated that their highlighting of the paper had helped them to see that one of the two papers Rachael had distributed was 'choppy' and 'jumped all over the place' because there were few repeated colors. The other paper, however, was clearly more coherent because colors were repeated. Thus Rachael found that color-coded highlighting facilitated discussion because it provided visual cues, enabling students to track connections among the parts in a longer text.

Lo-Tech Tools as Episteme: Implications for Pedagogy

While digital technologies have created exciting opportunities for multimodal composing, they have primarily focused on the oral, aural and visual modes. Lo-tech tools, however, allow us to include a fourth modality, the kinesthetic. They also provide opportunities for social interaction that are conducive to learning. Crayons and highlighters allowed students to playfully interact in ways that affirmed students' brainstorming and reflection processes, and they also allowed students to recontextualize their understanding of hi-tech course content and interaction in a low-tech context. Index cards and post-it notes gave students tactile and social opportunities to write on the cards, move them around, carry them with them, and also work collaboratively to share cards, exchange them, and make engaged decisions about how to use the writing that was on the cards. Lastly, group interaction reaffirmed the value of typical kinesthetic uses of highlighters in identifying, coding, and organizing information, as well as location genre features.

Although we have discussed lo-tech tools in the writing process, we are not imagining the use of these tools in the production of lo-tech products exclusively. There are many ways that lo-tech tools can be used to support epistemic learning in the classroom. Students could be encouraged to use these tools to compose a range of products, from a typed essay to a multimodal video with images, text, and sound. Or, in an even broader sense, students could be encouraged to use these tools in ways that do not require composing at all. Instead, these tools can serve epistemologically, not only to help students

process information and demonstrate understanding, but also to create knowledge with no formal product as the end result. In other words, we challenge the assumption that lo-tech tools should be used only as invention or process tools or as stepping stones toward a more sophisticated hi-tech product.

Considering the additional applications of this approach, a teacher could ask students to draw their understandings of a course concept with crayons; or, ask students to use sticky notes to make connections between historical events or between chemical reactions or other discipline-specific content. Teachers could design activities that encourage students to use highlighters to create codes of information, to categorize information, or to express hierarchies of information. Sticky notes afford students the ability to consider location, to move information around, to create maps of content or relationships. Different sized or different colored sticky notes or index cards can also help students learn to understand, create, or represent hierarchies of information.

Because of their multiple affordances (e.g., stickiness, colorfulness, association with childhood, portability, size), these lo-tech tools can help students visualize, categorize, rearrange, code and process information through kinesthetic engagement with course materials. At the same time, they encourage teachers to adopt a spirit of play in their pedagogy and foster that same spirit in their students. Most importantly, lo-tech tools serve as epistemologically valuable, providing ways for students to make meaning in their own texts, from the texts of others, and to create new knowledge in the writing classroom and beyond.

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