Researching Collaboratively: Teachers, Teams, and Technology

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While driving here to the conference, I was looking for a way to describe modern collaboration. Collaboration is not new. As humans, we collaborate in trade, in living arrangements, in the arts to make music and images, and in many other areas. Now with improved technology and the tools to support synchronous and asynchronous teamwork, we might be in an age that future scholars will call the era of collaboration.

Crowdsourcing: The Story of WAZE

I want to talk for a few minutes about modern collaboration: Crowdsourcing. Crowdsourcing is a portmanteau of crowd and outsourcing, meaning leveraging technology, specifically the internet, to outsource work from or to a crowd. The concept of gaining assistance from a large group of people is not new. In 1714 the British Government sourced a solution from anyone and everyone (a crowd) to help construct a device that could calculate longitudinal coordinates at sea. Applying technology to crowdsourcing, however, is new. Adding the internet to the mix allows us access to larger crowds and the ability to garner solutions through multiple channels.

A great example of today's crowdsourcing is one I use routinely while driving: Waze. Waze uses individual drivers to help improve the driving experience by collecting and analyzing data from the driving crowd using their app.

As an avid user of Waze, I have witnessed firsthand the amazing power of a crowd. When I first started using Waze, I did like many new Waze users. I poked at it a bit and took its advice to reroute or follow its routing with a large grain of salt. Until one day I was driving through Atlanta to a conference. During that trip, Waze directed left to move into the HOV lanes. It was a strange directive (back then it used to avoid E-ZPass lanes or express lanes, now there is a setting) so I looked at it skeptically, but complied. Now there were a few of us driving to the conference from Savannah, but I was in the lead; the other group left about 30min after I did. Shortly after moving into the HOV lanes I noticed the regular lanes on I75 were at a standstill. I scrutinized the Waze output more carefully. (It shows you red lines to indicate bad traffic.) When I looked, I saw red lines ranging almost all the way from Macon

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to Atlanta). There was a bad accident and only, only the HOV lanes (isolated behind a short wall) were clear and open. I made it to through to Atlanta and the conference in almost record time. My colleagues behind me suffered in 2hrs of bumper-to-bumper traffic.

Since then, I have let WAZE be my guide when I drive in unknown (and sometimes known) areas. As a modern collaboration tool, it is a stellar example of what collaboration supported by technology might look like in years to come.

I want to approach collaboration in two different ways today: first I will discuss collaboration in teaching and then about collaboration through digital tools. Along the way, I will talk quite a bit about myself as I explain my research and how and why I connect teachers, teams, and technology. After this talk, I hope you will understand more about collaboration, the ways digital tools can be helpful to us as educators, and what we might do to leverage digital resources now and into the future.

Background: A Tinkerer and a Talker

My background influences my work with collaboration and technology. When I was a kid, I was both a communicator and a tinkerer. I was the kid taking things apart and then explaining how I did it to everyone else. As you can imagine, both my hands and my mouth got me in quite a bit of trouble back then.

My tinkering led me to engineering; I went to school for biomedical engineering and then subsequently obtained a master's in metallurgical engineering. I worked at a couple of steel mills for about 6 years. My love of tinkering and talking served me well as an engineer. I performed experiments, wrote reports, performed more experiments, wrote more reports, gave oral presentations, etc. Soon I was called upon to write more reports, S.O.Ps (or procedures), guidelines, requirements, instructions, etc.

In 2000, I tinkered and talked myself into a job doing educational research for teachers. One thing led to another, and I became a technology specialist working for an administrative department at one of my alma maters—the Illinois Institute of Technology. At IIT, I was charged with developing a technology help desk that could build and service computer labs and provide technology solutions for the surrounding Bronzeville community. While I directed IIT's Digital Media Center the help desk put together technology training programs for high school students and community centers.

As center director, I saw how the Chicago public schools (one of the largest public school systems in the U.S.) deployed broadband across the southside, and I assisted their teachers in late evening classes on how to access the internet via modem before their schools were wired. I watched IIT build out

its technology infrastructure, hire their first Chief Technology Officer (who was my boss), and deploy enterprise-wide software systems like Blackboard and an upgraded Banner. My help desk was responsible for building a dozen brand new computer labs in the community, in a few libraries and YMCAs, and in multiple elementary/middle schools. Additionally, we supported the hardware, software, and training programs for those labs and had some funding to help teachers procure technology, learn to use technology, and provide strategies to help them use technology in their teaching. It was these cumulative experiences as a young researcher, engineer, and digital media specialist that showed me how companies deploy technology and how people as users of that technology struggle: succeed and fail, with the tech tools.

History: Quickly Changing Technology

Just as I witnessed the last few Southside schools get wired for broadband connectivity, wireless internet was beginning to take hold. My department went from crimping and pulling wires to installing wireless Cisco routers. My video division moved from using hundreds of digital video tapes to just a few SD cards that could be reused almost immediately.

To illustrate how quickly technology was changing, let's take a quick look back in history. At the turn of the century, the term Web 2.0 was coined to explain the concept of improved software where software would be connected to the internet to permit user interconnectivity. This new architecture allowed users to start generating and sharing content such as pictures, blogs, videos, text, and most importantly ideas on the internet. Web 2.0 was a dramatic software innovation and ushered in new ways to improve content sharing and communication.

In the year 2007, the iPhone was announced to an amazing reception. People waited in long lines at Apple's then 164 stores on "iDay" for hours for the first iPhone. For me, the iPhone launch denoted a line in the sand where our most personal hardware devices (items we carry with us everywhere) finally met our expectations. And back then, most people were unaware of the kinds of technological, political, and ethical maneuvering happening in the background of our everyday lives. But iDay was a moment of hardware awareness for the public.

Figure 1 shows just a few of the innovations to influence teaching over the last 18 years, and I would like to call attention to two in particular.

First, one of the most significant influences for teaching is the learning management system (LMS) software which began with D2L in 1999. As of 2014, the LMS reached 99% saturation in the higher education markets with a vast majority of faculty members using it (Rhode et al., 2017).

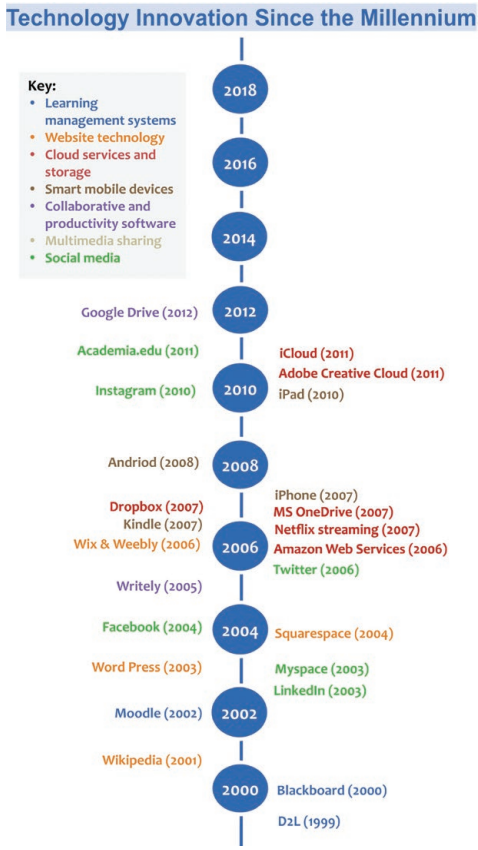

Figure 1. A timeline showing 20 years of technology tools that influence our teaching. These milestones help in some small way to illustrate just how far technology has progressed over the last 20 years. These events had a tremendous influence on teaching and our ability to connect, share, collaborate, and organize through technology.

Second, I would like to call attention to 2005, the year that spawned cloud documents and web sharing of those documents. These services like Writely which later became Google Docs, Dropbox, and Office 365, are now staples in today's workplace collaboration and communication.

So, let me bridge these ideas of collaboration and technology and apply them to our field: communication and writing. I want to add "learn" to this saying: to connect, share, collaborate, organize, and learn through technology.

Teachers: Understanding the State of the Field

My non-traditional entry to the field of writing and communication, as a cen-

ter director and only part-time teacher/trainer meant I needed more experience in teaching at the college level. I applied for and was accepted to The Marion L. Brittain Postdoctoral Fellowship at GeorgiaTech. As a fellow, I was able to teach service classes and to participate in seminars on digital pedagogy and research methods.

Both courses were a really interesting glimpse into how a variety of scholars with different backgrounds taught writing and communication and managed the digital in their classrooms. The courses were designed to embolden these scholars to try more and do more digitally. Georgia Tech could support all manner of digital technology, and the fellowship encouraged our experiments and forays into these areas. I entered the required methods course with a number of questions.

Just how did writing and communication teachers who were not at Georgia Tech teach with digital technology?

- What did other scholars do and use in the classroom and how do they define digital pedagogy?
- What were the limitations of these digital ideas? How did teachers deal with these limitations?

For me, questions mean projects, and I decided to embark on a path to uncover answers to these questions. The research methods course even needed a final project. It was perfect! I convinced the rest of the class to jump in the deep end with me.

I wrote a grant and received support from the 4Cs to launch a study and collect teacher data. Three colleagues with the support of two mentors from the program helped me to create the survey and collect the data, perform interviews, and obtain teacher artifacts related to their digital teaching habits. We received responses from 328 teachers and conducted 65 remote interviews.

The first article from this research project came out in fall 2019 in *Computers and Composition*. We have titled the article: "State of the Field: Teaching with Digital Tools in Writing and Communication". It addresses a single research question: *How are digital resources used by teachers in the writing and communication classroom?* There was no room to address all of our other questions. So, look for more articles in the "State of the Field" series. I anticipate at least one more will be published next year.

In developing and conducting this research, we uncovered a number of really interesting conceptual issues. The first set of issues was centered around the actual questions we needed to ask. It was difficult to construct a survey that would provide us the answers we needed. It was easy to see why prior scholarship about pedagogy consisted of classroom anecdotes rather than da-

ta-driven studies (Lam and Boettger, 2017). Let me describe the issues first before I get to the survey results.

1. Teaching is a mystery

One, teaching is in some ways still a mystery. Especially in light of the digital tools and resources afforded to us as teachers and to students as learners. Sure, we make syllabi; we have a schedule; we have learning objectives, we give lectures, we might even have rubrics. But even more granular than that,

- What tasks do we perform in the classroom?
- How do those tasks relate to learning in the classroom?

So, the first part of this study focused on figuring out what our tasks were in the classroom. Previous researchers had written out some of these tasks. However, most of these researchers had done so more than 30 years ago. When my five colleagues and I deliberated, we could identify 14 different tasks conducted in our classrooms. The 14 teacher tasks are shown in Figure 2. They include all the tasks most of us do regularly in our classes. For example, we all plan our lectures and activities and track our student progress.

Figure 2. A list of the 14 teaching tasks present in the typical writing classroom.

2. How do we describe extent?

Two, we needed a way to describe the extent to which we use digital resources in the classroom. For example, if I asked for a raise of hands for how many of you use email in service to a teacher task, you might all raise your hand. Many of us use email to contact students about various topics, to receive late assignments, or to distribute class information. But, let's say you have an email

assignment in class. If you teach professional communication, you just might. But with this question, how many use email in your teaching? I would not be able to tell the difference between you emailing a student about an assignment and you asking students to create an email in an assignment.

In reality, what we wanted to know is how you are deploying digital tools in your classroom. So, we developed a scale to help with this issue. As you can see by this figure, we took what is essentially a familiar ranking and co-opted its meaning. We replaced the responses with our own six-points scale:

1. plan with before class,
2. talk about in class, and
3. demo it during class, then
4. view (students see it in class), and
5. use (students use it as part of an activity), and
6. make (students produce it as an assignment).

We named the first three options on our scale: Teacher actions, and the latter three: Learner actions.

3. Tools - Today's Ephemera

Three, digital tools come and go. Tools, whether digital or not, are just tools. As such, as soon as their usefulness ends, they are removed from use. We, as a society, look for tools that perform required functions better, have improved software affordances, have more desirable features, or barring all that, are just cheaper than other tools.

And now to a short quiz. Don't worry it's really easy and I won't ask for answers out loud. If you miss one, just have someone near you explain it.

Some of us (perhaps most of us) remember the Blackberry. It was replaced (for the most part) by smartphones like the iPhone or phones like it.

- What about the slide projector? For those of you who remember the slide projector, it was replaced with PowerPoint software.
- What about the transparency projector? Well, we use a document camera now, sometimes called an Elmo.
- And the hardest of all. Who remembers the mimeograph? We used it to make copies and thus, it was eventually replaced by a copy machine or a printer.

In each of these examples, we can think of the replacement that is used today.

Digital tools are ephemera, here until something else better, easier to use, or cheaper comes along. A recent example of technology ephemera was evi-

dent in an article that evaluated teacher tool use in 2006 by Daniel Anderson, Anthony Atkins, Cheryl Ball, Krista Millar, Cynthia Selfe, and Richard Selfe. To put this article in perspective, 2006 was one year before the iPhone launch and four years before Google docs. At that time, Microsoft Word was our go-to writing tool. In 2006, researchers asked whether or not teachers were using Word or PowerPoint as tools in the classroom.

But what we really want to know (and what these scholars also wanted to know) was whether teachers were using composing software in their classes. We don't necessarily care about Word per se; currently, we can swap that out with a huge list of items that includes Word, Google Docs, Iworks, LibreOffice, AbiWord, and so on.

So, one last way to fix issues with our data collection was to find a way to talk about digital tools in broad categories, which we called resources. That allowed us to collapse the unending list of digital tools to 20 different digital resource categories (see Figure 3).

Figure 3. Some resource and tool categories.

As you can see, we have collapsed apps like MS Word into a category called "Productivity software," PowerPoint and Prezi into a category called "Presentation software," and so forth. So, what did these three new ways to conceptualize questions get us? These ideas gave us a reasonably systematic way to describe the **tasks** we perform, the **extent** of these actions, against the digital **resources** we use in our teaching. So, what did we find?

4. Study Findings

We found a number of interesting things in answer to the RQ: *How are digital resources used by teachers in the writing and communication classroom?* Let me cover just a few points.

Important point 1: familiarity plays an important part in resource choice

Our data allowed us to speculate on how familiarity plays a part in our choices of resources. Teachers and students may be more comfortable with familiar resources that have broad availability on institutional and personal computers. These resources become the go-to choices for teachers faced with decisions about allocating limited time in their busy classrooms.

Important point 2: Familiarity constrains innovation

Teachers' return to and reliance on familiar resources can constrain our field's ability to innovate and leverage new technologies. By pushing beyond the familiar, we can begin to fulfill various disciplinary challenges to value and embrace technology as central to what we do.

Important point 3: Teachers sometimes teach themselves

Our study found that over one-third of teachers either teach themselves or use their own knowledge to support their digital pedagogy. Teachers do tend to collaborate to teach themselves tools.

However, in our field, we collaborate infrequently in research.

Little Collaboration: Our Teachers Don't Collaboration (Much) In Research

We are at unparalleled time in history where collaboration has created an unprecedented level of research cooperation "whereby human beings pool their experience, knowledge and social skills with the objective of producing new knowledge" (Bozeman and Boardman, 2014, p. 217).

Publication Collaboration

We can see this in our publication record. Researchers are collaborating more effectively:

If we look at the sciences,

- Among the Web of Science—over 75% of indexed articles are co-authored. This trend is not specific to certain disciplines.
- Among JSTOR articles (JSTOR stores 12 million academic publications across 75 disciplines) co-authored articles rose to over 60% in 2011;

And what about computers and writing fields?

- For technical communication, those of us in English departments publish collaboratively only 39.3% of the time (Lam, 2014).

- But when our departments are co-located in the sciences or engineering, we publish collaboratively over 85% of the time (Lam, 2014).
- A relatively casual review of articles published over the last 9 years (2010-2019) in Computers & Composition shows that 39% were co-authored in keeping with English affiliated Tech Comm authors.

As practitioners of communication and writing, we know collaboration is important. We know the world is comprised of teams operating in various contexts. Teaming is a demanded industry skill (Scott, 2014) and a long-standing goal for us as educators to include in our classes (Burnett, Cooper, & Welhausen, 2013). Skills to manage teams are essential competencies, now more important than ever since trends indicate a surge in collaborative activities due to newer workplace configurations such as Agile, Scrum, virtual teams, and others (McCulloch, 2016). But we as mentors, as sages, as facilitators, we as teachers often don't model collaboration in our scholarship or teaching.

Is it because many of us have horror stories surrounding collaboration including issues of social loafing, people taking credit when credit was not due, people stealing ideas or work, or systems that don't value collaborative work? Maybe this is why we don't include collaboration in our school programs in any frequency. Few of our programs have courses that center around collaboration. As of 2011, only 9% of Technical and Professional Communication (TPC) programs had a required course devoted to collaboration and only 15% included such a course as an elective (Melonçon and Henschel, 2013). Some of us might include collaboration in our courses, but we don't yet track that information.

When we do have collaboration in our classes, we don't often teach collaboration. Instead, we as instructors, assign a team project and just expect students to extrapolate what teams need to function well. We assume that collaboration methods are already known or emergent from practice rather than teaching students both to manage the team and manage the project. So, what do we need to do to teach and/or learn to collaborate?

A Google study

A recent Google study emphasized the importance of fostering productive team climates. The study code-named Aristotle—a tribute to Aristotle's quote, "the whole is greater than the sum of its parts" began in 2016. The goal of the study was to answer the question: "What makes a team effective at Google?" Google examined 51,000 employees in 180 teams over three years. They found that psychologically-safe environments were critical to establishing norms that allowed teams to be successful (Duhigg, 2016). So, as Google notes, in a

team with high psychological safety, teammates feel safe to take risks around their team members. Noted scholar Amy Edmondson, insists that to collaborate effectively members need to feel protected from the inherent interpersonal risks associated with collaborative work (Edmondson, Higgins, Singer, & Weiner, 2016).

Data from Our Psychological Safety Study

My colleagues and I took a good look at this a few years back. We asked some of the same questions, but we wanted to know if education around these topics could help improve PS? We examined teams from three universities giving them training and collecting surveys on their progress. We found that training might help to make teams feel somewhat more psychologically safe, but that training likely needs to be more targeted and related to the collaborative activity they are undertaking. We also found that the duration of the team might have an impact on the PS level of the team. So perhaps with targeted training and an effort to keep members in a team for defined amounts of time, collaboration in teams, in general, can be improved.

Appeal: More Collaboration Needed

So, part of this talk is to call not just for more studies about collaboration, but to ask us to actually collaborate more regularly and update our tenure and promotion policies so that we obtain credit for those collaborations. There is a precedence for credit for collaboration in engineering, the sciences, and the social sciences. For us, collaboration allows us to make connections across disciplines and can add value to both our own and our students' experience. It allows those of us in the humanities disciplines to build bridges across the university and among universities and to further enhance the value we provide. And, we already know how to collaborate to learn things. We just need to use that same ingenuity to write and do research.

Learn to Leverage Tools: State of the Field

Let me return to digital tools to bring these ideas together. Recall that our data in the *State of the Field* study revealed a few things about how teachers leverage tools: teachers mostly relied on familiar leaving the newer tools and, thus, innovations with these tools unexplored. Of course, there are numerous good reasons for these decisions. But, instead of returning to the familiar in our teaching even in light of the numerous pressures to do so, why don't we let our goals and objectives guide us?

Research: Goal Setting Ideals

We can take our cues from empirical research. Typically, when we perform research, we do so to answer questions that we form. Using research questions is common regardless of the discipline, although how formally we address or consider our research questions is discipline specific. For example, in the sciences, they not only use overarching research questions but also hypotheses. In both instances, formulating an overarching question guides and shapes the research and helps to narrow and focus our efforts by pointing to a methodology, and providing a systematic way to proceed through the various stages. I suggest we do something similar in our teaching. That not only do we strive to bring our students the best, most appropriate learning experiences, but we do so with a digitally-focused pedagogical plan in mind.

Teaching: Goal Setting Via the Digitally-Focused Pedagogical Plan (DPP)

In our prior study, when asked the question, *"What is digital pedagogy?"* The answers we got back were myriad. Most of us pointed to assignments and what we do with them. For example, we might ask students to create a podcast based on their primary research, or produce a video demo about a particular piece of software.

When asked, *"What role does digital play in our pedagogical approach?"*, our responses focused on describing what digital tools do for us as teachers. Some said that digital tools were:

- Facilitation mechanisms: allowing us to produce share and show work.
- Highly adaptable resources: facilitating our teaching and helping students to adapt their work across modes.
- Content shapers: creating more diverse and interesting assignments, allowing classes to be much less one-dimensional.

While we do talk about the digital in terms of content and usage both in the classroom and by our students, our study revealed that we don't talk about digital as an overarching thread in our work. Let's reflect on that for just a moment: at this Computers and Writing conference, most teachers did not have a plan for how to systematically address computers/technology in their teaching.

How many of you have a digitally-focused pedagogical plan (DPP) that you could articulate? I know I didn't before this research. Our splintered approach to technology likely has to do with how we each were introduced to the digital realm, and the fact that innovative digital learning products were born barely 10 years ago.

1. Few of Us have a Digitally-Focused Pedagogical Plan (DPP)

Not having a DPP is an easily rectifiable problem. The simple act of articulating a plan (our DPP) will help us all to ensure we make more clearly related strides toward accomplishing our goals. Just like in our writing, whether we write in free form or from an outline, we will have in our head a direction we want to go. We need that same process operating with the digital in our classrooms.

2. Getting your plan in place: UX-ING THE PROBLEM

To help think through this issue, I suggest we apply a classic UX (or user experience approach) to this particular issue. User experience is one way to ensure that the user (in our case the student) is considered early and foremost in the process. UX helps to create something useful and usable and perhaps delightful for the user. Broadly a UX approach or process covers four areas in sequence.

1. You want to discover the issue and better understand the problem and the stakeholders.
2. You need to decide on an approach or approaches that will address the problem you have articulated.
3. You want to create a solution (it could be one of many solutions) that answers the first and second and is specific enough to be evaluated.
4. You want to employ a technique to evaluate your solution, so that if that solution is not working well, you can go back to step 2 and rinse repeat. Ultimately, if the solution proves effective, you want to continue to improve it.

Since we already have "discovered" the issue—we need a DPP, and it will help to guide us in the classroom, we can begin at step 2: Decide. We need to leverage our existing knowledge, and perhaps an existing framework to help us with this issue. Then once we have the framework, we can put our plan in place for a specific timeframe—let's say a semester, and then evaluate and make changes as necessary.

3. Habits of the Mind (HoM) as a Framework

One convenient framework to consider for this issue is the NCTE's Habits of the Mind (Council of Writing Program Administrators, National Council of Teachers of English, and the National Writing Project, 2011). NCTE's eight Habits of the Mind (or HoM) are habits that we might like to instill in our students through the writing, reading, and critical analysis experiences that we create in the classroom. The HoM framework gives us an overarching question to evaluate our actions against. While it is not a perfect framework

(as it wasn't developed to specifically address technology), the HoM can help give us some guidance until we find a framework that better meets our needs.

Our teacher research did ask about the priority for the HoM values. The results are shown in Figure 4; the top three areas were engagement, flexibility, and creativity.

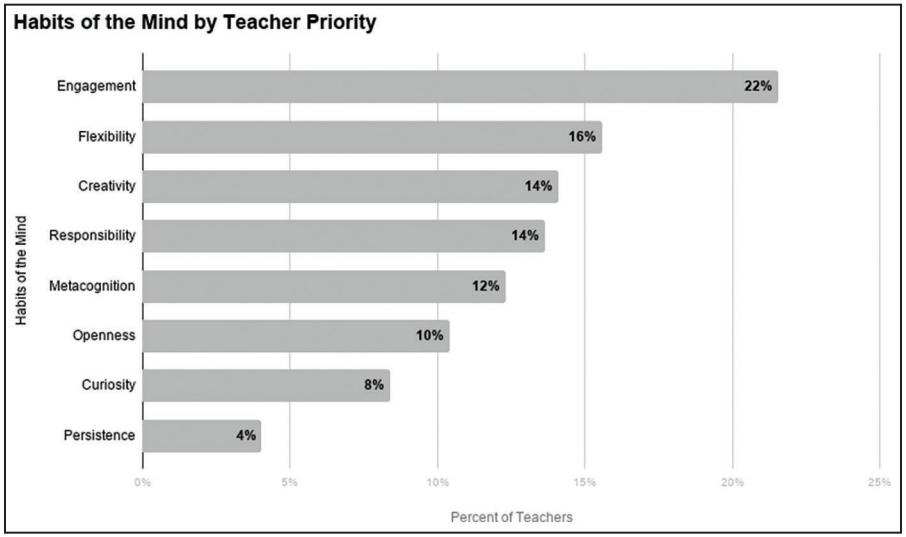

Figure 4. Priority for the Habits of the Mind areas in the Writing and Communication classrooms

4. Make A Digitally-Focused Pedagogical Plan

Now just because the majority of participants from my study valued engagement, doesn't mean that you do. Since your DPP needs to be personal, you would choose one of the habits that you want to inspire in your students. The more personal the choice, the more likely you are to stick to it. So, using the HoM helps to identify our approach. Next, we can wed that choice to one of the 14 tasks we perform in the classroom for your Decide step.

Here is an example of my DPP. For me, I value flexibility the most, and I want my students to have the ability to adapt to situations, expectations, or demands. So, my question (somewhat like a research question) is "How do I instill flexibility in my students? Taking a look at one of the 14 tasks, I chose: Collecting completed assignments. And, the question now becomes, "How do I instill flexibility in my students through how I collect completed assignments?"

5. Create a solution - Step 3

Moving to step 3, I need to develop a solution that will address this question.

Well, I feel like there are numerous ways to introduce flexibility in this task. I might attempt to instill flexibility in these ways:

- Talk about how important it is for students to be adaptable and let students know this is an overarching goal of the class or a crucial takeaway in the class.
- Require that students have different types of tasks to perform to complete their assignments: I might ask my students to write a memo that accompanies a final report and includes a client video.
- Require that assignments are turned in using an appropriate digital format: I might ask that all drafts are completed in google docs while all finished deliverables are completed in PDF. I might also have students use Word to send in any memos related to the project.

6. Evaluate - Step 4

Moving to step 4, I would want to employ a technique to evaluate my solution. That way, if that solution is not working well, I will know and can fix it. In this case, I might have a simple two or three question survey at the end of the course that asks about whether or not they felt my solutions (from step 3) helped them be more flexible, why or why not, and how likely they would recommend my class to another student. Then each semester, I might (using the same questions) evaluate your progress and make changes if my users (students) are not responding well to efforts. In one of the subsequent semesters, I could pursue another teacher task toward the overarching HoM goal. For example, I might look at another task from our 14 tasks like, "Facilitating in-class activities".

Also, with that goal in mind of instilling flexibility, I can concentrate on how I assess and introduce tools. As an example, if I want to ensure students are flexible, perhaps instead of concentrating on students being able to work in Photoshop, I would consider moving between a slate of photo editing tools. I might also think about how to help students do more in their use of photoshop, instead of just using Photoshop as a photo editor to do touch-ups. There are a number of ways to pursue this goal, once you have decided on your DPP, and of course a number of ways you can address it in the classroom.

7. DPP in Tenure

Let me also emphasize that having a DPP also gives you a clear narrative for your tenure file. Not only can you provide these experiences to improve your student's expertise in class, but you can articulate this process and way of thinking about it in your annual review.

To Recap

Let me recap. Your DPP (digitally-focused pedagogical plan) need not be complex. Selecting one of the habits of mind would help to provide you with an overarching framework or plan that would help to focus your efforts. Your DPP can be very targeted initially, perhaps focused on one of the tasks you do in a complex teaching environment, and you can grow the tasks over time. Your DPP need not be long term; tackle it from semester to semester (or quarter to quarter) and one class at a time. Evaluate your progress using a short survey. Begin the evaluation at the start so you can watch students improve over time. Finally, having a UX process in place for how you manage your digital pedagogy will help to provide you with talking points about your class to your students, potentially improved student outcomes, provide you with data to support your annual review.

Collaboration: How Does the DPP Fit In?

How does all this impact how we collaborate? Well, remember when I talked about how teachers collaborate around tools and serve as resources for each other supporting our use and deployment of tools? I hope that we continue in this vein to share our DPPs: What's working? What's not working? and perhaps Why?

1. Unpacking our Progress as a Field

I envision us (all of us) looking field-wide at these issues. Digging deeper to understand better why some processes work well and some don't. We could begin with a simple collection of results from our DPP efforts. For example, as teachers using the DPP we might answer a three-question evaluation survey each semester/quarter. We would do the survey through openly available software and share the results widely with each other so that anyone who wants to tackle writing about it could.

The questions we might answer could be something as simple as:

1. What HoM was your focus?
2. What teaching task was your focus?
3. How did your students rate your effort? (using the NPS)

I suggest to answer the last question, we use something like the net promoter score aggregated from our students' survey. The NPS (cite) system is a 10-point standardized measure for customer satisfaction and gauges whether users (in this case your students) like your approach so much that they would tell their friends about it. The NPS allows you to rate your progress in the DPP and interpret the results at a glance.

2. Technology Agency

Second. Setting DPPs will eventually provide us more agency over the technology that proliferates in our lives. Instead of choosing technology for technology's sake or because we are pushed to a decision, we should choose our technology deliberately. We need to exercise our own agency in dealing with, using, and selecting technology. We need to make decisions about software that not only fit our goals but that reflects careful consideration of the software company's stated ethics statement.

We often don't think about this, but our tools are just as political as our news. As we choose tools, we buy-in to a particular type of ethics and politics associated with those tools. Ethics, in particular, is a thin line (crossed often) when it comes to apps and software. Developers, through some of the protocols issued in with Web2.0, can now watch our every website visit and click, collect our locations and observe what we read and download. This raw data is then translated into accurate predictions about our preferences and habits AND used, through machine-learning assumptions, to suss out our political leanings, sexuality, and race. Developers can then sell this information not just to the highest bidders but to every bidder. Therefore, we should investigate the End User License Agreement (EULAs) and visit the websites of those developers to see what they say they are doing with our data.

And tell our students to do the same. So yes, we need to make wise choices.

A Refrigerator Story

I began this talk with a story about Waze. Waze is a success story for its users and stakeholders. It is a great example of a tool that seems to fit the needs of users it supports. Waze provides their users agency to accomplish their goals of getting to and from work without the stress of waiting in a lot of traffic.

Let me end this talk by discussing a smart fridge. The story came from a recent clip showed by a student in one of my classrooms. I won't play it for you here as it has coarse language, but I will describe the scenario. For those of you who watched "Silicon Valley" the TV show on HBO the example comes from there.

Essentially, a few programmers live in a household together. One comes into some additional funding and purchases a smart refrigerator that has a programmable user interface and talking assistant. Another roommate complains that it is stupid to have a refrigerator tell you essentially what you already know: you just finished all the milk or whatever. On top of that, to make the fridge work, you had to scan everything you want to put into the fridge one by one. If you didn't, the fridge would complain that you put something into the fridge incorrectly.

This is an example of technology modifying the user's behavior to fit its affordances. However, if this technology fit one of your overarching goals (for example, to manage your food purchases and consumption), then the fridge is probably a reasonably good fit for you. If instead, you try this fridge and it does not bring value to you because of the way you eat or manage food, then it should be returned to sender.

This example is not designed to shy you away from exploration. We do need to explore. We need to try and test various apps, ideas, or ways to use technology. "Experimental moments" is a phase my colleague Lisa Dusenberry coined to refer to our various trysts with technology - trying to see what fits our needs and leaving behind those that don't. Some of our trysts can be small like trying out a different news app, a new website for citations, or exploring different ways to save your files on your computer. Regardless of what we decide to try, we should approach technology methodically, especially anything we use in our classrooms. We, as educators, must keep in mind that the technology we bring to the classroom should be answering a need or solving a problem. It should be helping our learners learn. Whether it is a smart map app or talking refrigerator, technology must provide us value.

Conclusions

Let me end by saying that we are in a technology evolution, we are being bombarded daily by messages, spammed by opportunities to purchase resources, while entities are tracking our data and making decisions about our lived experiences. All the while technology improves at an increasingly rapid rate.

However, we need to be willing to seek the tools that will advance our goals. We shouldn't just choose technology and stick with it because it's familiar. Rather, we should be willing to look. Remember too much familiarity constrains innovation and stifles creativity.

With limited time and opportunity and expanding student enrollment, we don't have the bandwidth to explore every tech app or digital resource, instead we should invest our efforts into strategically selecting and using tools that reflect modern workplace practice whether the tools help us with our writing, help us navigate effectively, lets us send emojis, or track the food in our fridge.

Most importantly, as teachers, we must deploy digital technology strategically in service to the practices that help our learners learn. As educators, whether we are in English departments or engineering departments, affiliated with libraries, or working in design studios, we must make strategic choices about what is important to both our students and our programs.

Finally, we must leverage our agency and not be subject to the political and ethical whimsy of developers: Their tools need not dictate our behavior.

Rather, we should choose tools that fit our expanding needs. AND regardless of how we use or interact with technology, we must remember that technology is not a substitute for nor should it supplant our interaction with other humans. Instead, our human interactions—our collaborations—should be enhanced by our improved ability to connect, to share, to organize, and to learn through technology.

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