Multimodal Communication in the University: Surveying Faculty Across Disciplines

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Abstract: While a strong case has been made for addressing multimodality in composition, the case has been less clear for WAC/WID and CxC programs and research. Studies of disciplinary communication have documented the use of multiple modes in a number of fields, but few engage directly with theories of multimodality or with multimodality in context of changes related to networked, digital media. This study presents a snapshot of multimodal communication practices and assignments across disciplines developed through a survey of faculty at a research-intensive public university. Quantitative results indicate that, with some disciplinary variation, faculty across disciplines use multiple modes of communication in their professional work, their scholarly communication, and their pedagogy. Qualitative analysis of faculty responses complicates this picture with diverse conceptualizations of the relationships between modes. Themes related to faculty experiences of genre change and to the challenges of communicating about multimodality across disciplines are also addressed. These results justify the need for professional development efforts focused on multimodality in the context of WAC/WID and CxC programs and for continued research on multimodality in university contexts, even as they point to the challenges of communicating across disciplines that lack shared vocabulary. [1]

The conversations seemed to be going well. A couple of groups had already started sketching rubrics on their whiteboards and were earnestly discussing what criteria to include. This faculty workshop on evaluating multimodal assignments had been prompted by questions raised about assessment at an earlier workshop on multimodal assignments. Vanessa was pleased to see the depth of engagement between lecturers and graduate teaching assistants. Both had much to offer each other on this topic.

A lecturer in a group that had yet to start drawing or writing raised his hand. Vanessa squeezed past another group to join them.

"How's it going?" Vanessa tried to sound upbeat, but she had misgivings. At the earlier workshop, a substantial amount of time had been spent addressing concerns about the appropriateness of multimodal assignments for a WID-based first-year composition curriculum. Vanessa hoped those

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concerns had been addressed adequately, so that their discussion could stay focused on assessment, but perhaps not.

"Well, we're having trouble getting started," David began. "Each time we try to think of something, it ends up being exactly what we would put on a rubric for an essay. And when we do think of new criteria, we can't get over the idea that we don't have the expertise to teach something like, say, video editing and therefore can't fairly assess students on it. It doesn't feel fair to penalize students for something we haven't taught adequately."

Vanessa nodded. "That's clearly a concern. Many of us have been grappling with that as we confront what composition means in today's communication environment. Multimodality can take us into uncomfortable—"

"Frankly," he interrupted, "considering our curriculum focuses on writing in the disciplines, it's hard to even put in the effort to address these issues without knowing if multimodality is really relevant to what's going on in the disciplines. I'm still associating it with popular and personal writing and not with academic and disciplinary writing."

The issues raised about multimodal composition instruction in this scenario[2] are doubtless familiar to many of us. By now, expertise, assessment, curricular alignment, and territoriality have each been the subject of numerous articles, books, and conference presentations on multimodality. These issues also continue to figure in formal and informal conversations in writing programs of all sorts as instructors and writing program administrators grapple with the role multimodality plays and can play in their curricula. Because much of the impetus behind composition's attention to multimodality has come from the changing communication landscape in personal and civic contexts, the exigence for following a similar path in WAC and WID programs has been less clear.

For example, in her landmark CCCC Chair's Address, "Made Not Only in Words," Kathleen Blake Yancey (2004) took a large part of her exigence for expanding the focus of composition beyond alphabetic text from the amount of self-sponsored writing students are doing in this new communication landscape. Paralleling the development of the "reading public" in the nineteenth century (p. 298), Yancey argued for compositionists aiming to help students "develop as members of a writing public" (p. 311). An important part of her call included "revisit[ing] and revis[ing] our writing-across-the-curriculum efforts" (p. 308), but the details for how to do this were left implicit. Similarly, the New London Group's (1996) influential *Harvard Education Review* article, which put the importance of multimodality and multiliteracies on many compositionists' radars, centered on changes to communication practices in three areas of our lives: "our working lives, our public lives (citizenship), and our personal lives (lifeworlds)" (p. 65). Changes to academic and disciplinary communication, however, were left unaddressed. As Elizabeth Allan (2013) has pointed out, the "multimodal turn's"[3] roots in compositionists' attention to students' "extra-curricular experiences" and "the ways multimodal texts circulate in popular culture and in public discourse" has meant "we have paid relatively little attention to the rhetorical aspects of academic multimodal composing in the context of undergraduate education outside of writing studies."

We know, of course, that modes[4] other than alphabetic text play prominent and often essential roles in many disciplines (disciplines like architecture, design, and musicology come to mind). The coexistence of WAC/WID (Writing Across the Curriculum/Writing in the Disciplines) with CxC (Communication Across the Curriculum) underscores the importance of both the written and spoken modes of language for disciplinary work and communication, as well as for student learning and communication across the university. If we include numbers as a semiotic mode, it becomes that much clearer how important multimodality is to rhetoric and knowledge construction throughout the disciplines. While the relevance of modes other than alphabetic text and of the combination of

modes to numerous disciplines is evident, however, these may not be used or conceptualized in ways consistent with the approaches to multimodality that have developed in composition. Multimodality, in fact, is not a subject that has been addressed prominently in the WAC/WID literature, a gap that can leave instructors teaching in those programs, as in our opening scenario, wondering how the "multimodal turn" might inform their own work and curricula. The fact that digital media have played a large role in the changes to communication and literacy *outside* the academic context has left many instructors responsible for teaching specifically academic writing wondering if they have played a similar role in changes *within* the academic context.[5]

Drawing on these theoretical, programmatic, and curricular exigencies, we sought to examine the range of multimodal communication[6] represented in the pedagogy, professional, and scholarly work across the contemporary university, focusing specifically on a U.S. research institution as our context[7]. The present survey was designed to form a preliminary snapshot of multimodal communication practices and assignments across disciplines. Collaboratively designed by a team of researchers with collective backgrounds in composition, communication, design, and WAC/WID, the survey was distributed in 2014 to faculty at a Southeastern U.S. research-intensive, land-grant institution. While STEM-related disciplines outnumber humanities and social sciences disciplines on this campus, these two large disciplinary groupings were equally represented among the survey participants, providing a useful look at the multimodal communication faculty across disciplines report engaging in and assigning to their undergraduate students. The sections that follow offer a brief literature review, describe our research context and methodology, offer results and analysis, and conclude with some implications for WAC/WID and CxC programs and research.

A Brief Review of Selected Literature

As we have pointed out, the conversation and research on multimodality in composition studies and computers and writing has been quite strong for the last two decades (e.g. Alexander & Rhodes, 2014; Anderson et al., 2006; Arola, Sheppard, and Ball, 2014; Kress, 2010; Murray, 2009; Palmeri, 2012; Selfe, 2009; Shipka, 2011; Wysocki & Johnson-Eilola, 1999; Yancey, 2004). Rather than reviewing this literature, we focus briefly here on how multimodality has been examined by those researching communication in the disciplines (using "communication" broadly to refer to all modes used to communicate).[8] The fact that modes other than alphabetic text are important to a range of disciplines is borne out by this literature.

Much work exists on the visual mode in scientific work and communication (Elkins, 2010; Ford, 1992; Mishra, 1999; Pauwels, 2006; Robin, 1992). For example, while he does not treat it at length, Charles Bazerman (1981), in his analysis of Watson and Crick's landmark article on the structure of DNA, notes their use of a diagram on their first page in order to provide "the geometrical essence of the solution" (p. 368). In their book on visual design, Gunther Kress and Theo Van Leeuwen (1996) point out that visuals play a prominent role in scientific meaning making. Reporting on his linguistic analysis of textbooks across disciplines, Ken Hyland (2000) notes the prevalence of "endophorics," phrases such as "see above" that refer to other parts of the text, in science and engineering textbooks, a finding he interprets as indicative of those disciplines' use of "a variety of semiotic systems to make meanings" (p. 119). Jeanne Fahnestock's (2003) numerous scientific examples in her analysis of visual and verbal parallelism reinforce the importance of the visual mode for scientific discourse. She finds, for example, that "tabular presentation of instances, examples, or data sets that would otherwise require parallel or repetitive phrasing are the norm in scientific discourse" (Fahnestock, 2003, p. 140). In their work on multimodal semiotic analysis, Anthony Baldry and Paul Thibault (2010) examine "meaning compression" in scientific writing, arguing that "scientific texts have always combined and integrated language and visual images in the making of the specialist meanings

of scientific discourses" (p. 70). More recently, Lynda Walsh and Andrew Ross (2015) have reported on visual invention in STEM disciplines. Alongside these works on the visual and verbal modes in science, some work also exists on other modes or combinations of modes. Jay Lemke (1998), for example, characterizes scientific concepts as "semiotic hybrids" comprised of multiple modes, including the visual and mathematical (p. 87). Chad Wickman has reported on both the scientific laboratory notebook as a multimodal genre[9] (Wickman, 2010) and on how computational simulations work semiotically within the discourse of theoretical physics (Wickman, 2015).

Beyond the sciences, some research on disciplinary uses of modes other than alphabetic text exists as well, particularly on disciplines that rely quite obviously on those modes, such as art, design, and architecture (Haust, 1998; Medway, 1994; Morton, 1990; Dias, Freedman, Medway, & Paré, 1999; Orr, Blythman, & Mullin, 2005). In addition, research on the use of particular modes in certain disciplines has been conducted within those disciplines themselves, without explicit connection to WAC/WID or CxC. Ethnographers, for example, have written about the use of visuals in ethnographic research and writing (Alfonso, Kurti, & Pink, 2004; Pink, 2001, 2013; Schwartz, 1989).

Some of the work cited above also engages with multimodality in professional communication. Among their findings on workplace writing, Dias et al. (1999) point out that communication in the workplace habitually occurs across multiple modes and that these modes may be used "more flexibly and diversely" than in many academic contexts (p. 39). In her review of writing in the professions, Anne Beaufort (2006) describes a number of studies that account for modes other than alphabetic text in workplace contexts (pp. 228-229). And in the last few years, the MODE research center at the University College London has regularly published work on communication in surgical operating theaters, yielding insights into the use of touch and gesture for communication and learning (e.g. Bezemer, 2014; Bezemer, Cope, Kress, & Kneebone, 2014).

All of this supports the claim that many disciplines rely on modes other than alphabetic text to do their work and to communicate about it. Many of the studies listed above, however, focus on a single mode at a time, without theorizing or analyzing the critical interplay between modes, or limit themselves to the verbal and visual. Work that engages with multimodality directly exists in the "across the disciplines" literature (e.g. Anson, Dannels, & St. Clair, 2005; Bridwell-Bowles, Powell, & Choplin, 2009; Fordham & Oakes, 2013; Stein, 2008; Whithaus, 2012), as well as some that engages with multiple modes without direct engagement with theories of multimodality (e.g. Fahnestock, 2003; Werry & Walseth, 2011). Space remains, however, for work more explicitly in conversation with theories of multimodality, as well as for inquiry on how digital media and mobile technologies may be changing communication in the disciplines. Networked digital media have been tied to increasing multimodality in other spheres of communication. It behooves us to examine how these sorts of changes may be playing out in disciplinary communication as well, and, particularly in the U.S. context, to consider the implications of those changes for FYC programs conceived of as gateways to learning communication in the disciplines.[10] While this sort of research could not fully resolve the dilemmas raised in our opening scenario, it could help faculty engage with a more capacious understanding of composition, and it could also help justify and support professional development efforts focused on multimodality or digital media, whether in context of FYC or WAC/WID and CxC.

As we worked through the literature, it was striking that so much of the research in disciplinary communication is ethnographic in nature, often taking a case study approach. For example, in her analysis of the architecture "design crit," Allan (2013) relies on ethnographic inquiry so as to avoid imposing her disciplinary understanding of multimodality on other disciplinary cultures. She cautions that we can render multimodality and certain genres "invisible" by relying "on research methods, analytical terms, and a theoretical lens that privilege writing as a verbal mode." The sensibility Allan expresses calls attention to a compelling exigence for research on multimodality in

other disciplines—as Allan puts it, "writing studies scholars cannot take for granted that our perspectives on written, oral, visual, digital, or multimodal communication are shared by other disciplinary cultures, nor that our preferred rhetorical strategies will be compatible with their discipline-specific values and practices."

While ethnographic case studies such as Allan's are useful, they offer the "deep dive," the "microview." Although some survey research has been conducted (e.g. Anderson et. al, 2006) that offers a broader picture of multimodality as enacted specifically within composition and writing programs, our goal was to offer a "macroview" of multimodal communication across disciplines. Our survey was designed to explore the range of multimodal communication at a single institution, something we felt would be useful both for the campus community and for those in the wider WAC/WID and CxC communities. Conducted in 2014, roughly a decade after the widespread use of Web 2.0 technologies[11], our survey was meant to capture both longstanding multimodal disciplinary practices and changes that may have developed in tandem with the more widespread changes in communication and literacy outside academia.

Research Design

Context

Our institution, a large land-grant university in the Southeastern United States, leans toward STEM disciplines in its research and instructional programs, though it includes strong programs in the social sciences and humanities as well. The undergraduate curriculum includes one required FYC course, which was redesigned in 2004 to introduce students to research and writing in the disciplines. FYC faculty often reference Patricia Linton, Robert Madigan, and Susan Johnson's (1994) "Introducing Students to Disciplinary Genres: The Role of the General Composition Course Language and Learning Across the Disciplines," an article that has played an important role in professional development for incoming FYC faculty who do not have backgrounds in WID and are unsure of what they can contribute to such a curriculum. While faculty sometimes incorporate WID-based assignments, they more often include rhetorical analysis assignments (sometimes with a field research component) that are reminiscent of WaW courses (Writing about Writing).[12] The course gives students an opportunity to practice and develop as writers, but, just as importantly, is designed to expose students to important threshold concepts about writing, research, and disciplinarity that will support their adaptation and continued development as they continue their rhetorical education beyond FYC.[13] This development is further supported by a strong campus culture of writing and speaking, a commitment made evident by the establishment of its Campus Writing and Speaking Program (CWSP) in 1997. This WAC/WID and CxC program does not operate through a specific curriculum or through WI-designated courses, but instead supports the University's colleges through consultations and professional development opportunities as colleges and faculty determine how to integrate writing and speaking meaningfully into their curricula. The program collaborates extensively with English, Communication, the Faculty Center for Teaching and Learning, and the undergraduate tutorial services, with the director of CWSP currently from English and the associate director from Communication.

Survey Design

The Qualtrics survey we sent out to faculty had nine questions[14], divided into six screens, covering demographic information on their teaching and college affiliation before focusing on the types of communication faculty assigned undergraduates and participated in themselves. The first three questions were multiple choice and asked for participants' informed consent, their teaching status,

and their college affiliation. Our fourth question used a drop-down menu to ask for departmental affiliation. Each presented on separate screens, questions 5-7 were multiple choice, multiple answer questions offering 33 options for common types of communication faculty might assign their lower-division undergraduate students (Q5), their upper-division undergraduate students (Q6), and participate in themselves (Q7) (see Appendix A for our list of communication types). The final two questions were open ended and presented together on a single screen: (Q8) "How does writing interact with other media in your field and assignments? (e.g. visuals, audio, video, etc.)"; (Q9) "Is there anything else you'd like the share with us about the types of writing you assign or engage in your field?" Our custom end-of-survey message offered a link to a separate Qualtrics survey where interested faculty could provide their contact information if they were interested in coming to speak to faculty in the FYC about their disciplinary communication (separate surveys allowed us to maintain anonymity for our main survey's results). Three participants chose to complete this separate survey. Most faculty took 5-10 minutes to complete the survey, with some faculty who answered our open-ended questions taking closer to 20 minutes.

Designing a survey on multimodal communication for participants outside of composition studies or communication proved challenging. Because we recognize that the terminology and phrasing we incorporated impacted our results, this deserves attention here. For example, for those studying composition and communication, "multimodal" tends to be a meaningful term, with most now familiar with Gunther Kress's definition of "mode" as a "semiotic resource" (e.g. Kress, 2010). Many of us are also familiar with the debates over terminology that have occurred in context of the scholarship on multimodality (e.g. Lauer, 2009, 2012). Considering these debates, we decided that, while imperfect, "multimedia" would be the term most familiar and meaningful to those outside our disciplinary context. We also deliberated on whether this term might confuse some familiar with these debates over terminology (or cause them to question our expertise and the value of the survey), but decided the benefits in communicating with faculty beyond our own disciplinary context outweighed this possibility.

Our survey was designed collaboratively, beginning with a list of broad communication "types" that made the use of modes within them explicit (Appendix A). Because the survey was meant to be exploratory and because we wanted to be mindful of not imposing our own disciplinary biases on those in other disciplines, we emphasized modes over genres in our list of broad possible communication types, though our parenthetical help text included a few possible genres that might participate in each category. While we were familiar with some genres used in other disciplines, we also knew that there were likely to be a number of genres we had no knowledge of and, as dynamic and only ever "stabilized-for-now" (Schryer, 1993), a number of new genres not yet represented in communication-related literature. Understanding genre as a social, intersubjective phenomenon—an element of "cultural rationality" (Miller, 1984, p. 165)—it was important to us not to impose an etic perspective on the potential genres used in a given discipline, instead favoring an emic approach that would respect participants' rhetorical knowledge about their own disciplinary contexts, though we found this difficult to accomplish with a survey. This understanding of genre informed by the work in rhetorical genre studies (RGS) is behind our distinction between "genre" as an emic phenomenon residing in distinctive social contexts and communication "type" as an etic construct developed for an analytical purpose. While not informed by RGS, Douglas Biber (1989), in "A Typology of English Texts," finds it useful to make a similar distinction between genre as "folk-typology" belonging to "speakers of a language" and "text types" as analyst-identified categories based on purely linguistic similarities and differences (p. 5). In the early stages of survey design, we considered open-ended questions asking faculty to list the multimodal communication types they engaged in (an approach that might have allowed us to identify genres meaningful to users in distinct

disciplinary contexts), but quickly determined that this would be too challenging for participants to answer and would make analysis of responses less meaningful.

In the end, we arrived at a fairly exhaustive list of 31 possible types of communication faculty might be engaging in or assigning across disciplines (plus an "n/a" and "other" option). In addition to our own deliberations over which types to include, we also had a composition faculty member with expertise in multimodality provide feedback on them, which we used to refine the list. Participants encountered this list three times in the final survey. The three versions of the list corresponded to three contexts we were interested in: (1) what faculty assigned in their lower-division courses (generally understood to be 100 and 200-level courses), (2) what they assigned in their upper-division courses (300 and 400-level courses), and (3) the types of communication they engaged in in their own professional work. As this example illustrates, most communication types included an option for that type as a single mode (e.g. alphabetic writing) or as multiple modes:

- Option 12: Technical writing without visuals/multimedia (white papers, usability reports, documentation, etc.)
- Option 13: Technical writing with visuals/multimedia

This example also highlights the limited way we used the concept of genre, which was mainly as parenthetical "help" language that suggested a few genres that might participate in the communication type.

Finally, because the survey was meant to be exploratory and we did not want to make assumptions participants had no way of correcting, we chose to include two open-ended questions. The first (Q8) was meant to give participants space to reflect on the use of and *relationship* between modes in their disciplines and the second (Q9) simply asked participants if there was anything else they wanted to share with us about the types of writing they assigned or engaged in. We had a great deal of difficulty crafting the first open-ended question, considering the phrasing:

> How does writing support other media in your field and assignments?
>
> How do other media support writing in your field and assignments?
>
> Because this question implied that one mode must always support another, we instead opted for the more concise:
>
> How does writing interact with other media in your field and assignments? (e.g. visuals, audio, video, etc.)

This question generated quite a few useful responses, but a number of participants also expressed confusion, a confusion that only emphasizes the challenges those researching and teaching multimodality continue to face in communicating about it.

Participant Sampling

We chose to distribute the survey using a purposive network sampling approach. This meant tapping the networks of targeted participants via an influential, credible node in each network. We first asked the director of CWSP to distribute it to that program's listserv of faculty across campus, an approach that favored networks of faculty who already had an interest in undergraduates' development as communicators. We also distributed it directly to all department heads and to the director of the

First-Year Writing Program on campus for distribution through their departmental listservs. In total, we had 65 faculty consent to participate and complete the survey.

Data Analysis

Because our survey yielded both quantitative and textual data, we combined quantitative and qualitative approaches in our analysis. The communication-type lists yielded quantitative data, which we analyzed by frequency. For these frequencies to be most meaningful, we found it useful to remove responses that had selected the "N/A" option (Option 32) on a given question. At this stage in our study, we found that the differences between responses on lower- and upper-division assignments were not significant enough to maintain this distinction and complicated both analysis and presentation of the results in a way that was not analytically productive. In order to combine these results into a larger "undergraduate assignment" category, we took the higher number between lower- and upper-division on any given communication type selection, as reflective of how many faculty had ever assigned the type in any undergraduate course. For example, 14 participants reported assigning "written essay exams" in their lower-division courses and 15 reported doing so in their upper-division courses. In this example, we took the higher number, 15, as the total number of participants who reported assigning written essay exams to *any* level of undergraduate. We also took the larger number of responses minus the lower number of N/A responses as our total number of responses on Q5 and Q6 combined (n=49), which we used to calculate percentages for undergraduate assignments. In our "written essay exam" example, this gave us a percentage of 31% of faculty who reported teaching undergraduates and who assign written essay exams to some level of undergraduates. A higher number of faculty responded to Q7, which asked "In your own professional work, which of the following types of communication do you engage in? (choose all that apply)" (n=65).

To facilitate comparison by discipline, we divided responses into two broad disciplinary areas based on the college affiliation faculty selected: (1) natural, physical, and applied sciences (n=30), and (2) humanities and social sciences (n=30)[15]. For comparisons of faculty by discipline, then, our total participants number 60, as we had to exclude 5 participants who did not select a college affiliation. This number is lower on the questions about undergraduate assignments: (1) sciences (n=25), and (2) humanities and social sciences (n=24).

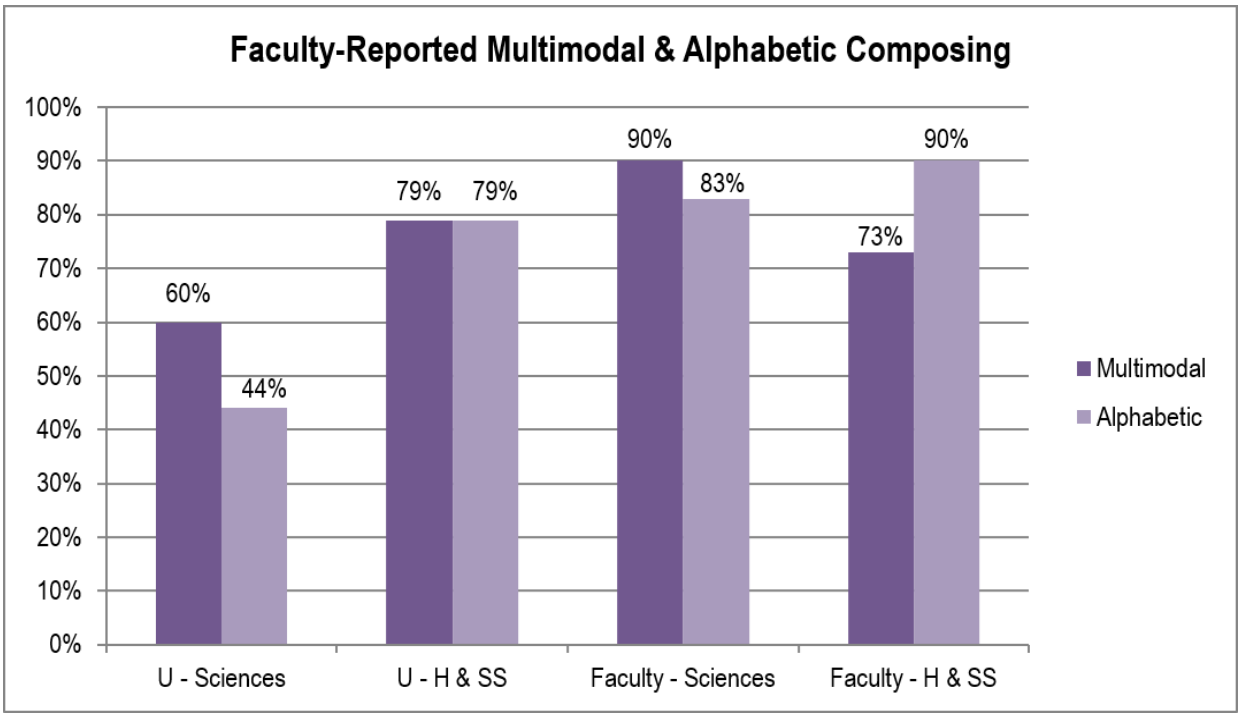
For analysis of the two open-ended responses, we included all participants (n=65), without removing participants who did not indicate a college-affiliation. We employed techniques from grounded theory (Glaser & Strauss, 1967), with two researchers open coding the responses independently of each other using inductive coding with attention to repetition, and then comparing codes to reduce codes and develop consistent code definitions. The researchers then recoded based on this collaboratively-developed coding scheme. This process yielded the three main themes reported on in our "Qualitative Results" section. Inter-rater reliability was calculated using Cohen's Kappa, resulting in a Kappa score of 0.86, within the acceptable range for satisfactory inter-rater reliability.

Quantitative Results: What are Faculty Composing and Assigning?

For those wondering whether faculty across the disciplines compose and/or assign multimodal texts, the answer according to our participants is clear: yes. If we define multimodal composing as using two or more semiotic modes to create meaning in a single text and do not automatically equate it with digitality, then 83% (n=54) of our 65 faculty participants do compose multimodal texts in the course of their professional lives, with "Presentations with a visual/multimedia component (e.g. poster presentations, slideshows, etc.)" the most common instance of this (at 83%).

Comparing this by disciplinary area (Figure 1) reveals that for science faculty (S faculty), the percentage reporting composing multimodal texts in the course of their professional lives is even higher, at 90%. This number, however, is lower for humanities and social sciences faculty (HSS faculty): 73%. For HSS faculty, composing alphabetic texts still plays a large role in their professional lives, with 90% of them reporting doing so. The distinction between what faculty report doing themselves and what they assign, however, is worth examining[16]. An equal percentage of HSS faculty report assigning alphabetic texts and multimodal texts to their undergraduate students: 79% for both. This is higher, but not terribly far from what they report producing themselves. For S faculty, however, the percentages for both types of assignments are substantially lower than what they report producing themselves: 60% of S faculty report assigning multimodal texts to undergraduates and only 44% report assigning alphabetic texts. This substantially lower rate of assigning composing of any type to undergraduates than what they produce themselves among S faculty may reflect any number of factors, including different pedagogical traditions in the sciences, different learning goals, different teaching conditions, and/or different theories of knowledge and learning. Our survey cannot answer why this difference exists, but confirms that the trend exists, at least in this institutional context.

Figure 1. Comparison of Faculty-Reported Multimodal & Alphabetic Composing and Assignments across Disciplinary Areas



Note: Sciences, n=30; Humanities & Social Sciences (H & SS), n=30; U=Undergraduate Assignments

This, however, is only a rough snapshot of how many faculty report composing or assigning multimodal texts. Our fairly exhaustive list of text types affords us a more nuanced view of the types of texts being produced by faculty and undergraduates. Ranking the top ten text types participants selected out of the survey's 31 possible choices uncovers a diverse picture of composing (see Table 1), with some areas of commonality across categories and several notable differences.

For example, with the exception of HSS faculty, the most commonly reported text type for both faculty and their undergraduate assignments was "Presentations with visual/multimedia component." The second most common text type was "Formal academic writing without visuals/multimedia," with these two reversed for HSS faculty. Not surprisingly, "Formal academic writing with visuals/multimedia" also ranked highly across categories, occupying the 3rd ranking for both HSS faculty and their undergraduates and the 4th ranking for S faculty and undergraduates. Considering how common charts and graphs are across disciplines, it is almost more surprising that this was not ranked higher than "Formal academic writing without visuals/multimedia." It is possible charts and graphs are such naturalized parts of writing for some participants that it did not occur to them to count these as "visuals." Fahnestock (2013), for example, posits that tables are such a defining feature of scientific writing that it might "be more correct to say that a text becomes 'scientific' if it presents its data in tabular form" (p. 140). We see one more clear point of commonality for faculty across disciplines with "Professional writing (e.g. résumés, business letters, memos, etc.)," which represents what was reported as the 3rd most common type of composing for S faculty and the 4th for HSS faculty. Here, however, we begin to see a divergence between what faculty compose themselves and what they assign their students. "Professional writing" comes in as the 8th most common text type S faculty assigned undergraduates and the 11th for HSS undergraduates (not included in Table 1). This seems to indicate that faculty see their role with undergraduates as oriented toward the academic more so than toward professionalizing students at that stage in their development, meaning, to use Dias et al's (1999) terms, that faculty are more attuned to fostering epistemic communication experiences for their students than the instrumental or procedural communication necessary to get things done in a professional context. While these are integral forms of communication for faculty today, some participants may see these as either less relevant for their undergraduate students or outside their pedagogical purview in the undergraduate curriculum.

Table 1: Top 10 Text Types, Ranked (multimodal types, bold)

Rank	Undergraduate — Sciences	Undergraduate — Hum. & S.S.	Faculty — Sciences	Faculty — Hum. & S.S.
1	**Presentations with visual/multimedia component**	**Presentations with visual/multimedia component**	**Presentations with visual/multimedia component**	Formal academic writing without visuals/multimedia
2	Formal academic writing without visuals/multimedia	Formal academic writing without visuals/multimedia	Formal academic writing without visuals/multimedia	**Presentations with visual/multimedia component**
3	**Technical writing with visuals/multimedia**	**Formal academic writing with visuals/multimedia**	Professional writing (e.g. résumés, etc.)	**Formal academic writing with visuals/multimedia**

Rank	Undergraduate — Sciences	Undergraduate — Hum. & S.S.	Faculty — Sciences	Faculty — Hum. & S.S.
4	**Formal academic writing with visuals/multimedia**	**Written analyses of visual/multimedia objects**	**Formal academic writing with visuals/multimedia**	Professional writing (e.g. résumés, etc.)
5	Written essay exams	Written logs/reflections/journals/blogs / forum posts without multimedia	Technical writing without visuals/multimedia	**Websites**
6	Technical writing without visuals/multimedia	**Videos**	**Technical writing with visuals/multimedia**	Written logs/reflections/ journals/blogs/forum posts without multimedia
7	Written logs/reflections/ journals/blogs/ forum posts without multimedia	**Creative written projects with visuals/multimedia**	**Websites**	Public writing without visuals/multimedia
8	Professional writing (e.g. résumés, etc.)	Written essay exams	Written logs/reflections/ journals/blogs/forum posts without multimedia	**Written analyses of visual/multimedia objects**
9	Public writing without visuals/multimedia	**Written logs/reflections/ journals/blogs/forum posts with multimedia**	Presentations without a visual/multimedia component	Presentations without a visual/multimedia component
10	**Computer programs with multimedia & writing**	Creative written projects without visuals/multimedia	Public writing without visuals/multimedia	**Public writing with visuals/multimedia**

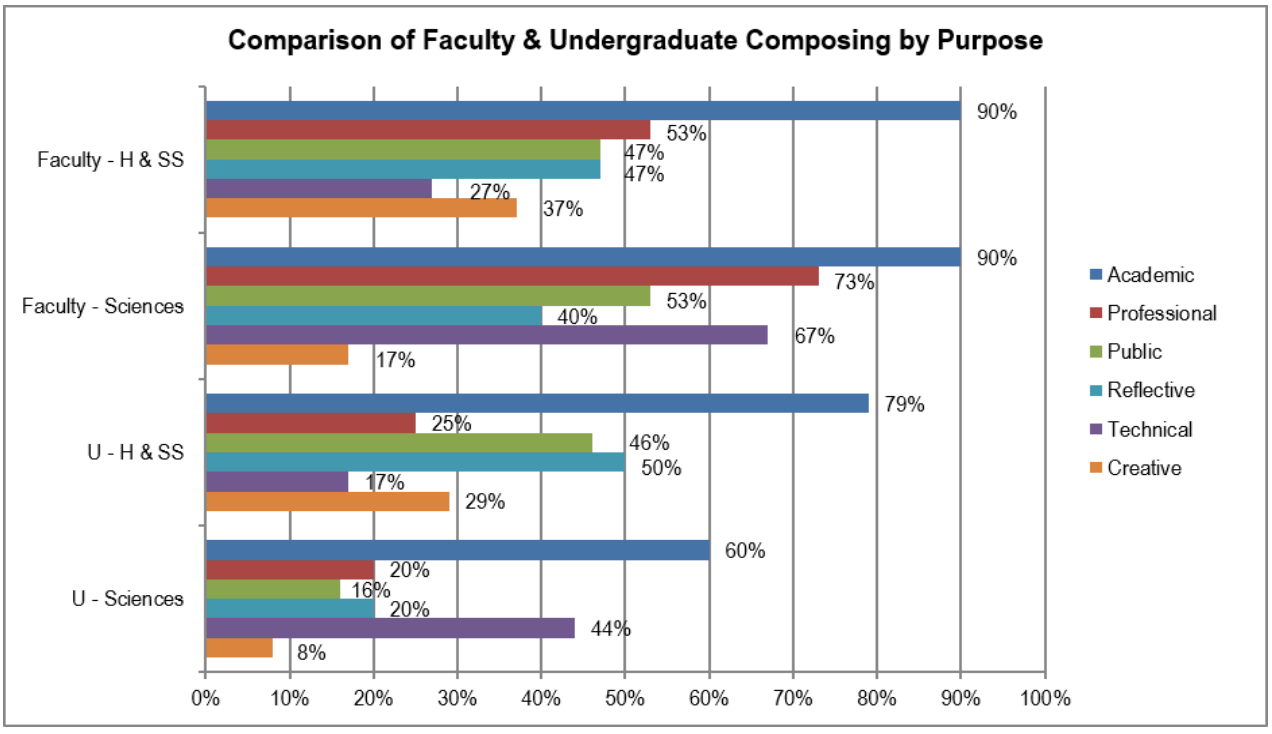
Beyond these initial points of commonality, several disciplinary differences begin emerging, the clearest of these being the role technical writing[17] plays for S faculty and their students. For faculty, "Technical writing without visuals/multimedia" and "Technical writing with visuals/multimedia" occupy the 5th and 6th ranks, while for their students, "Technical writing with visuals/multimedia" is the 3rd most common assignment and "Technical writing without," the 6th. This is unsurprising on a campus with a large engineering college, but differs substantially from HSS faculty and undergraduates, for whom technical writing is not in the top ten types of texts. HSS faculty did, however, report composing and assigning some technical writing, potentially in context of the technical communication program housed in this institution's English department. In contrast, "Written analyses of visual/multimedia objects" played a larger role for HSS faculty and their undergraduates, occupying the 4th ranking for HSS undergraduates and the 8th for HSS faculty. Judging by the types that fall higher in the rankings for HSS faculty, these faculty are choosing to emphasize this disciplinary type of writing for their students over some of the professional and public types they report doing themselves. Another notable, if expected, difference between the rankings is that "Written essay exams" is fairly high in the list of common text types for both S and HSS students (#5 and #8, respectively) and not present in the top ten text types for faculty. Again, it is difficult to identify why written exams land higher in the rankings for S faculty than HSS faculty based on this survey alone, as it may be reflective of any number of factors including different teaching conditions or theories of learning and assessment.

The picture of explicitly *multimodal* communication that emerges from the ranked list also emphasizes some notable commonalities and differences (bolded types are explicitly multimodal[18]). For example, "Presentations with visual/multimedia component" and "Formal academic writing with visuals/multimedia" are common across categories, coming in somewhere in the top four commonly composed or assigned type for both HSS and S faculty and their students. Both categories of faculty also reported composing for websites at similar rates, potentially in an effort to conduct extension work with the public. This is supported by the fact that public writing is in both faculty top ten lists, though the multimodal version, "Public writing with visuals/multimedia," is not in the S faculty top ten list. From here, the differences in multimodal text types emerge, with H faculty assigning their students a number of types that are less common elsewhere: "Videos," "Creative written projects with visuals/multimedia," "Written logs/reflections/journals/blogs/forum posts with multimedia." This potentially reflects the fact that those in humanities and social sciences disciplines (e.g. some faculty in English and communication) see part of their role in undergraduate education as helping students think critically and creatively about all facets of communication and meaning-making, including the rhetorical and semiotic affordances and implications of digital media. A portion of our HSS faculty participants doubtless share some of the goals for multimodal assignments identified in Anderson et al.'s (2006) survey of rhetoric and composition instructors, administrators, and staff members (e.g. writing center or writing lab staff), for whom "access to symbolic capital," "increased ability for critique or meta-cognitive awareness," and "practicing new, culturally valued forms of expression" figured prominently as goals for multimodal assignments (p. 70). Other disciplinary distinctions emerge when looking at the list purely for multimodal text types, including the prominence of "Technical writing with visuals/multimedia" for both S faculty and their students and the presence of "Computer programs with multimedia & writing" as a common assignment for S faculty's students. This latter assignment type suggests that, beyond rhetorical studies more broadly, there may be room to heed Kevin Brock's (2013) call for a "rhetorical code studies" in WAC/WID scholarship as well (p. 8).

In addition to painting a picture of multimodal communication in the disciplines, we realized that our survey could also tell us about rhetorical purpose in faculty composing and undergraduate

assignments (Figure 2). To facilitate this, we grouped our 31 possible text types into six general "purpose" categories: academic, professional, public, reflective, technical, and creative (see Appendix B). We then took the type that the highest number of participants selected as something they either compose or assign to calculate the percentage of participants who reported engaging in this type of composing in the course of their professional lives or assigning this type of composing to their students. This view of participant responses confirms some of the conclusions arrived at through the ranked list of text types. For example, it confirms that equal proportions of faculty in the sciences and in the humanities and social sciences compose for an academic purpose as part of their professional lives (90% for each). It also confirms that professional writing is an important type of composing for faculty, though more S faculty report engaging in it (73% of S faculty; 53% of HSS faculty). It also reveals that a slightly higher proportion of S faculty are composing for a public audience and that a higher proportion of HSS faculty are composing reflective texts. Marked disciplinary differences emerge in the technical category, with 67% of S faculty reporting composing for a technical purpose and only 27% of HSS faculty doing so. A contrast also exists with composing for a creative purpose—37% of HSS faculty report composing creatively and only 17% of S faculty report doing so. What is also worth noting, however, is that *science faculty are writing creatively* and that *humanities and social sciences faculty are writing technically*: the creative and the technical are not exclusively attached to disciplinary domains, but are in fact important parts of working and making meaning across disciplines.

Figure 2. Comparison of Faculty & Undergraduate Composing by Purpose



Note: H & SS faculty n=30; S faculty n=30; HSS undergraduate n=24; S undergraduates n=25; N/A selections omitted

In terms of the assignments these faculty are giving their undergraduates, more faculty report composing for all of these purposes than assigning them to their students in every category except reflective writing, which HSS faculty report assigning at a slightly higher rate than composing

themselves (47% and 50%). The gap between what faculty compose and what they assign, however, is fairly stark in several categories, with faculty assigning them at half the rate they report producing themselves (or less in some cases). For example HSS faculty report assigning composing for a professional purpose at half the rate they report doing so themselves (25% and 53%), while the gap is even larger for S faculty (20% and 73%). This, however, may be a function of the institutional context, which offers professional writing courses for engineering and the sciences through the English department. S faculty are also composing for a public purpose at a substantially higher rate than what they assign their undergraduates (16% and 46%). Similarly, they report writing for a creative purpose at twice the rate they assign their undergraduates (8% and 17%). These gaps may be explained by any number of reasons, including teaching conditions, assumptions about composition and communication, and theories of teaching and learning. The stark contrast, however, merits additional research, especially given the questions that have been raised about whether professional and disciplinary communication can be learned outside its social context (Downs & Wardle, 2007; D. Russell, 1995; D. R. Russell & Fisher, 2010). In the meantime, faculty might interrogate their local contexts and what factors there might be leading to gaps in what faculty produce and what they assign. Some of these, like teaching conditions (e.g. large lecture courses), may need to be addressed at an institutional level, while others, such as assumptions about how writing and communication are learned could be addressed through professional development and reflective teaching practices.

Qualitative Results: How do Faculty Conceptualize and Experience Multimodality?

While quantitative analysis is useful for confirming the presence and scope of certain communication types and practices among faculty, qualitative analysis of their responses to our open-ended questions provides insights useful for understanding how faculty experience composing and assigning in a changing communication landscape. The selection of "Websites" as an undergraduate assignment, for example, tells us that some faculty are assigning this type of composing to their students, but tells us nothing about the pedagogical rationales or struggles behind that choice. Qualitative analysis of participants' responses to two open-ended questions using techniques derived from grounded theory, such as open coding, gave us some insight into the experiences behind these selections and resulted in three main themes:

1. The Importance of Modes Beyond the Alphabetic
2. The Experience of Genre Change
3. The Challenges of Communicating About Multimodality

Theme 1: The Importance of Modes Other Than the Alphabetic

This theme consisted of responses indicating that modes other than the alphabetic are important to faculty's teaching, scholarship, and/or professional communication. The majority of participants' write-in responses fell in this category. Because this was such a widespread theme, we found it useful to separate responses into four sub-codes:

1. visual/auditory/video components *are used* in communication, applied to segments that indicated the use of visual, auditory, or video components with no evaluation of their significance
2. visual/auditory/video components *as a supplement or complement* to alphabetic text, applied to segments that indicated the use of other modes as useful but not necessary

3. visual/auditory/video components *as essential* to communicate information as clearly as possible, applied to segments that indicated that those modes were essential or integral to communicating their work
4. visual/auditory/video components *as a means to generate knowledge*, applied to segments that indicated the use of those modes for inventional and epistemic purposes—as a means of engaging with information for learning and thinking

Responses coded under the first sub-code indicated that modes other than alphabetic text are present in or a part of communication, often including the verb "use" with no explanation of the purpose or need for use. For example:

> We use visual aids in presentations and public lectures,

or,

> I use visuals (PowerPoints, for example) in my teaching and my students are often required to have some kind of PowerPoint for their in-class presentations.

The following response illustrates the second sub-code ("as a supplement or complement"), using writing as the central rhetorical and semiotic mode, and visuals as support for the alphabetically-realized main argument:

> Most manuscripts and grant applications I write include a number of graphs and visual images to help support and explain the text.

Several participants went out of their way to describe how "essential" these other modes were to meaning-making in their discipline. Here, these other modes are not complementing alphabetic text, but are "integral" to making and understanding meaning:

> I teach natural resources students who need to tie what they are saying to places and physical conditions, so the images and graphic representations of those conditions are integral to the messages. Somewhere along the line from English major and teacher to natural resources professor, I discovered that geometrical and quantitative reality typically become too abstracted when only presented in verbal modes. A good picture really is worth….

Finally, we had several responses that indicated faculty used modes other than the alphabetic as "a means to generate knowledge." For these participants, the knowledge construction of their disciplines would either not be available to them or be impoverished substantially without these other modes:

> Because I teach linguistics courses, we are constantly watching videos and listening to sound clips to hear types of language processes, and then the students are asked to write about what they hear. Audio & writing are central to my research. Current and past articles and book chapters I'm working on/ have worked on deal with the documentation and description of lesser-known varieties of English. Thus, I'm having to record speech, and then analyze those recordings, and then write about that analysis.
>
> Almost everything has a visual component to it. We look at data on graphs and charts, and use drawings to help us understand complex systems.

Superficially, this last response might seem like a use of visuals and numbers to support alphabetic text, but the participant explained that these were actually used as a means to understanding their object of study, with this analysis likely preceding and shaping the composition of alphabetic text.

Theme 2: A Moment of Genre Change

While responses that fell in our first theme shed light on the use of and relationship between modes in participants' professional experiences, a number of responses also included descriptions of how conventions and genres were in a state of flux, with temporal moves common within these (e.g. "more and more," "currently," or "becoming"). For example,

> Multimedia is becoming more important in both teaching and communicating research results within my field.

More specifically, several participants spoke about changing conventions in disciplinary journals and/ or conferences:

> Currently, the extent to which my writing interacts with visuals is figures in a paper, which are extremely powerful and useful for explaining concepts. Unfortunately, papers in my research area do not allow videos to be included with them. In reviewing papers, I occasionally stumble across a submission that uses an anonymous Youtube video to demonstrate a prototype in action. However, videos are sometimes difficult to include for review of double-blind manuscripts (the norm in my research area).

> I publish in online journals and actually started such a journal and include hyper links to other sites, videos, etc. Presentations at national meetings almost always include a variety of modes--i.e., videos, photos, music, etc. My students do similar presentations as we model in our program the power of multimodal literacies for middle school instruction, creation, and publication.

Both of these underscore the current moment as one of genre experimentation and change as scholars confront the affordances of networked digital media ("Youtube," "hyper links") and a changed (and constantly changing) communication environment. The former example is particularly illustrative of some of the conflicts and challenges that can occur as practices developed in a prior environment ("double-blind manuscripts") confront experimentation in context of the current environment ("Youtube videos").

Theme 3: The Challenges of Communicating About Multimodality

Finally, some of the challenges related to terminology that we experienced in designing the survey came through in participants' responses as well. Responses that fell into this category either reflected a misunderstanding of our question and/or of the concept of multimodality. For example, one participant wrote that,

> Writing is mostly analytic, but there is also a creative component in one of my courses. Recently I have also begun to give extra credit opportunities for more creative activities.

This response reflects an understanding of modes other than alphabetic as solely "creative," not seeing how these might also constitute or support the analytic. It is likely that many forms of

multimodality are "invisible" to someone who conceptualizes modes in this way, and therefore that he or she would omit relevant experiences in responding to our questions.

The following response likewise equates multimodality with creativity and uses the term "multimedia":

> The writing I assign in my undergraduate courses has fairly standardized formats, so there is not a great deal of room for creativity or introduction of added visual elements. The exception is website production, which does allow for personalized visual presentation and the integration of multimedia.

We cannot be sure whether this terminology is simply reflective of the terminology in our survey or whether this participant typically uses the term "multimedia." The example of website production that this participant provides serves to reinforce the difficulty we have in communicating about multimodality, since here one could argue that multiple media are, in fact, converging in one text. The challenges of making these distinctions continue to be debated by composition and communication scholars and make this sort of empirical research particularly difficult.

Finally, a number of participants expressed difficulty with our question, which tried to avoid imposing a relationship between modes that a term like "support" would express by using the verb "interact" instead. One response stated simply,

> What do you mean by "interact"? Beware reification…. Sorry but I don't understand this question.

For this participant, our use of a term like "interact," which implies a concrete relationship between modes, was foreign enough to come across as a logical fallacy, evidence that our attempts to minimize imposing our disciplinary lens on participants may not have been entirely successful.

Allan's (2013) case study in architecture specifically showed "how architects train their students to develop effective rhetorical strategies for multimodal communication in their own discipline *without ever using the specialized terminology of rhetoric or literacy studies*" (emphasis added). While her findings emphasize the commonplace nature of multimodal communication, they also point to the difficulty of talking about it across disciplines without a shared vocabulary. Our findings, particularly the responses to our open-ended questions, bear this out as a continuing challenge.

Implications for Pedagogy & Future Research

While the "across the disciplines" literature supports the claim that modes other than alphabetic text play important roles in disciplinary work and communication, few studies engage explicitly with theories of multimodality or take a larger snapshot of what this landscape currently looks like. This, however, can leave faculty in WAC/WID or CxC programs wondering about the relevance of recent theories of multimodality to their work. Our opening scenario ended with David questioning the relevance of instruction in multimodal communication in context of a WID-based FYC curriculum. In his words, "It's hard to even put in the effort to address these issues without knowing if multimodality is really something relevant to what's going on in the disciplines. I'm still associating it with popular and personal writing and not with academic writing or disciplinary writing." This survey was designed to explore the landscape of faculty multimodal communication and assignment practices across disciplines, in part to answer David's question. Considering that networked digital media have been tied to increasing multimodality in personal and civic communication, we felt that faculty like David would benefit from an updated look at what multimodality in the disciplines looks like in the

current communication environment. This research, of course, does not solve dilemmas of expertise, assessment, or territory. It does, however, help faculty in WAC/WID and CxC programs decide whether the issue is relevant enough to warrant the time needed to address those dilemmas.

Based on the results of our survey, the answer to David's question is "yes": faculty across disciplines *are* employing modes other than alphabetic text to do their work and to communicate about it. A great deal of this multimodality occurs in faculty professional and public writing, but faculty also report multimodality in their scholarly communication. Many of them also assign multimodal communication to their undergraduate students, with some disciplinary differences. If we find it important to confirm that students will encounter multimodality as they make their way across the curriculum, then our survey offers this confirmation. Of the top four types of texts assigned (Table 1), three of the four are multimodal types in both disciplinary categories. Given this, faculty in WAC/WID programs should have no concerns about the relevance of instruction in multimodal rhetorics. These findings, in fact, point to the need for instruction in purposeful uses of multiple modes of communication.

Implications for Pedagogy

Given our survey's findings on the prevalence of multimodal communicative practices across the disciplines, increased instruction in making rhetorically informed decisions about the uses and integration of various modes to communicate seems warranted, both in disciplinary contexts and in writing programs with WID-based curricula. That said, many have noted that modes acquire much of their meaning-making potential from their histories of use and cultural contexts (e.g. Wysocki, 2005; Kress, 2010). There is no reason to believe disciplinary histories and cultures don't bear a similar relationship with the modes used in disciplinary communication, making professional development that includes exposure to the diversity of multimodal disciplinary communication critical for writing faculty teaching WID-based curricula. In WID-based FYC programs, this can help temper the tendency to understand modes as having essential affordances in favor of an understanding of those affordances as socially and disciplinarily situated; in WAC programs, discussions of multimodality across disciplines can help make rhetorical practices that are naturalized and invisible in their disciplinary contexts more accessible for reflection and intervention. Generally, faculty in WAC/WID-focused writing and communication programs should, rather than considering multimodality as supplemental or tangential to their work, recognize the many ways that scholarship in all disciplines is always already multimodal (Palmeri, 2012), and view it as an integral part of the curriculum.

As the first theme in our qualitative analysis highlighted, modes other than alphabetic writing often play distinctive epistemic roles in the disciplines. This is significant for teaching disciplinary writing and communication (i.e. WID), but also suggests a rich area for "writing to learn" instructional strategies, perhaps reformulating these as "communication to learn" in order to tap a wider range of modes in students' learning.

As many faculty doubtless already realize, spending instructional time on multimodal communication in the local context of a specific discipline is, quite simply, a part of teaching and of professionalizing students within that discipline. Instructors, however, cannot take for granted that students will know and understand how to use different modes effectively and appropriately or that students will grasp this solely through enculturation. Instead, faculty might keep in mind that, as with teaching writing and speaking, spending time explicitly helping students to learn these features of disciplinary communication is worthwhile as it is part of learning to do the work of the discipline. Even for lower-level undergraduates, this can be a critical part of learning to navigate the discipline and its work. As one of our participants noted,

> Professional writing in my field is more and more going the way of multimodal products. The norm seems to be turning in favor of multimodal presentations and products as opposed to the straight reading of written work. As a result of this shift in professional work… I try to engage my students with media in my lower division classes to give them experience rhetorically analyzing and producing work that they're likely to encounter as they progress in their studies.

This sort of instruction is likely to play as big a role in disciplinary enculturation as "writing" has been shown to be. As with writing, however, composition programs can play a critical role in exposing students to threshold concepts about multimodality that can help facilitate student adaptation and enculturation in other disciplinary contexts.

One final point faculty might consider is the gap between the types of communication they engage in and those they assign their students. In some cases, this gap may be due to well-considered pedagogical rationales. In other cases, however, faculty may find that this gap is less deliberate and may merit reflection and intervention. As we articulated earlier, faculty might interrogate their local contexts and consider what factors there might be leading to gaps in what faculty produce and what they assign. Some of these may be linked to structural, institutional conditions (like large lecture courses); however, others may be linked to assumptions about how writing and communication (including multimodal composition) are learned that could be interrogated locally through professional development opportunities that promote reflective teaching practices and shared pedagogical strategies.

Limitations and Implications for Research

As the discussion of our survey design and results suggests, our survey has some limitations that researchers wishing to replicate our inquiry in other contexts might consider. Most obviously, and offering the clearest route for further research, our survey took place at a single institution, and a research-intensive institution at that. Conducting a survey of faculty across a range of institution types would provide a fuller picture of faculty multimodal practices and assignments and help determine how those might differ in less research-intensive contexts. A larger sample size would also afford analysis of more specific disciplinary groupings than our broad groupings of "natural, physical, and applied science" and "humanities and social science" faculty. It is worth noting as well that our research was conducted at a U.S. institution. Given the globalization of the business and research worlds and the "internationalizing of the teaching of English for academic and professional purposes" (Thaiss, 2012, p. 7), it is important that researchers consider possible transnational trends while respecting the distinctiveness of local contexts. The work of The International WAC/WID Mapping Project (Thaiss et al., 2012) offers an insightful study of writing in the disciplines in an international context; it would be useful to follow up both that work and our exploratory study with an international study focused specifically on multimodal communication in the disciplines.

Regardless of context, we recommend that future studies similar to ours include questions on faculty rank and duties (e.g. teaching only). While analyzing our results, we came to the realization that this information could have led to a finer-grained view of how these communication types and multimodal practices intersect with roles that might be oriented more toward research or toward teaching. Universities are complex, diverse communities. Ours, for example includes a wide range of ranks that could have some responsibility for undergraduate instruction, such as graduate teaching assistants, non-tenure-track lecturers, non-tenure-track teaching assistant professors, tenured and tenure-track faculty, postdocs, and adjunct faculty. So while our recruitment email and distribution methods privileged those with responsibilities for teaching undergraduates (n=63 for participants

indicating they do so regularly), we cannot know how many of those also have responsibility for conducting research and which of those may have limited access to the resources necessary for some types of multimodal composition (e.g. some adjuncts). We therefore recommend that future surveys of this type include a question about faculty status and responsibilities, since these may affect the type of disciplinary participation and communication they are likely to engage in regularly.

In addition, we recognize that through both our language choices and the disciplinary differences of our participants we may have unintentionally occluded some work that should be represented in the data. In hindsight, we realize that use of the terms "assign" and "assignment" suggest writing that occurs specifically as a part of coursework. This may have resulted in participants excluding other student writing experiences from their responses, such as experiences situated in lab or undergraduate research settings. In many sciences, it is common, for example, to include undergraduates as coauthors on journal articles related to their research duties. Such experiences serve as apprenticeships in the discipline and are significant in the professional preparation of students, making them an important consideration for any analysis of multimodal communication in the university. It is likely that participants included such work in responses related to their own scholarly and professional work, but did not consider the work of students in settings outside of the classroom in their responses about students. Similarly, we speculate that some multimodal practices, such as charts and graphs, are such a naturalized part of writing in their discipline that participants may not have included these in their responses; future surveys similar to ours would do well to render these more visible to participants, potentially by including these explicitly in parenthetical help text.

As we analyzed our results, we came to the realization that our results are also limited in our focus on final, composed texts or performances. This focus excluded from our results any multimodal components in the broader composing processes that led to the final text. It is likely that the production of a monomodal communication type involves composing processes in multiple modes, and that work is not represented here. As Paul Prior (2009) explains,

> Writing is a stream within the broader flows of semiotic activity. Once we see genres as produced in processes that have histories, then we find that multimodality arises not only when a particular text/performance is realized materially in multiple media, but also when we consider the multimodal chaining that marks historical processes. (p. 24)

Focusing on the Bakhtinian "chains of utterances" (Prior, 2009, p. 21) in the production of a text in addition to the end product allows a more complete picture of the uses and functions of various modes in generating knowledge and creating meaning. Attention to the process as a whole would offer enriched understanding of the significance of multimodality in academic communication.

Our findings also raise some additional questions that merit future research. Faculty, particularly in the sciences, reported communicating to publicize their work at a high rate. Understanding the pressures faculty are responding to in making this effort to publicize seems important, if only to understand the relationships between scholarly and public writing, which some have pointed out as more interrelated than generally conceptualized (e.g. Berkenkotter & Huckin, 1995; Fairclough, 2000; Hyland, 2000; Prior, 1998). This has implications for understanding the contemporary university as well as disciplinary enculturation. It may be that we find traces of disciplinary genres and uses of modes being influenced by public genres, much as Berkenkotter & Huckin (1995) found regarding the evolution of the scientific research article over the middle of the twentieth century. This influence may increase as the need to publicize research findings outside of the university becomes even more important amid questions about the "value added" aspects of university

education and the work of the university. Certainly, examination of how scholars across disciplines are negotiating genre change in their disciplinary contexts, including at the level of mode, can offer avenues for deepening our understanding of genre, multimodality, and disciplinarity.

Our findings, though exploratory, underscore how rich a research space multimodal communication in the disciplines may be, as studies of multimodality in other disciplines bring to light previously unexamined uses of and relationships between modes that may differ from what has already been found in other contexts, enriching both theories and practices of multimodality and "across the curriculum" programs and curricula. While case studies play a vital role in understanding communication in disciplinary contexts, broader-scale, "macroview" studies, such as surveys, can help us discover research sites that could prove fruitful for these more in-depth studies and for seeing how practices in local disciplinary contexts fit in the larger landscape of academic communication. We hope our results will inspire both levels of research and provide faculty and programs with an exigence for making multimodality a more central role in the teaching and learning of academic communication.

Appendix A - Survey Communication Type Options

Selection Number	Survey Text Type Options
1	Formal academic writing without visuals/multimedia (e.g. essays, reports, papers)
2	Formal academic writing with visuals/multimedia (e.g. essays, reports, papers)
3	Written analyses of visual/multimedia objects
4	Creative written projects without visuals/multimedia
5	Creative written projects with visuals/multimedia
6	Written essay exams
7	Written logs/reflections/journals/blogs/forum posts without multimedia (including lab notebooks)
8	Written logs/reflections/journals/blogs/forum posts with multimedia (including lab notebooks)
9	Public writing without visuals/multimedia
10	Public writing with visuals/multimedia
11	Professional writing (e.g. résumés, business letters, memos, etc.)
12	Technical writing without visuals/multimedia (white papers, usability reports, documentation, etc.)
13	Technical writing with visuals/multimedia

14	Presentations without a visual/multimedia component
15	Presentations with a visual/multimedia component (e.g. poster presentations, slideshows, etc.)
16	Installations with a written component (e.g. museum installations, agricultural installations, design, etc.).
17	Installations without a written component
18	Videos
19	Websites
20	Podcasts
21	Computer programs with multimedia elements (including writing)
22	Computer programs with multimedia elements (not including writing)
23	Visual products without a written component (e.g. plans, photos, paintings, etc.)
24	Visual products with a written component
25	Audio products without a written component
26	Audio products with a written component
27	Models/sculptures/prototypes without a written component
28	Models/sculptures/prototypes with a written component
29	Performance with a linguistic component (written or oral)
30	Performance without a linguistic component
31	Food product with a linguistic component (e.g. as part of a food science paper or presentation)
32	N/A
33	Other

Appendix B - Text Types Grouped by Purpose

Academic	• Formal academic writing without visuals/ multimedia (e.g. essays, reports, papers) • Formal academic writing with visuals/multimedia (e.g. essays, reports, papers) • Written analyses of visual/multimedia objects • Written essay exams • Presentations without a visual/multimedia component • Presentations with a visual/multimedia component (e.g. poster presentations, slideshows, etc.) • Food product with a linguistic component (e.g. as part of a food science paper or presentation)
Professional	• Professional writing (e.g. résumés, business letters, memos, etc.)
Public[19]	• Public writing without visuals/multimedia • Public writing with visuals/multimedia • Installations with a written component (e.g. museum installations, agricultural installations, design, etc.). • Installations without a written component • Videos • Websites • Podcasts • Computer programs with multimedia elements (including writing) • Computer programs with multimedia elements (not including writing) • Visual products without a written component (e.g. plans, photos, paintings, etc.) • Visual products with a written component • Audio products without a written component • Audio products with a written component • Models/sculptures/prototypes without a written component • Models/sculptures/prototypes with a written component • Performance with a linguistic component (written or oral) • Performance without a linguistic component
Reflective[20]	• Written logs/reflections/journals/blogs/forum posts without multimedia (including lab notebooks) • Written logs/reflections/journals/blogs/forum posts with multimedia (including lab notebooks)
Technical	• Technical writing without visuals/multimedia (white papers, usability reports, documentation, etc.)

	• Technical writing with visuals/multimedia
Creative	• Creative written projects without visuals/multimedia • Creative written projects with visuals/multimedia

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Notes

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[2] This scenario is a composite of the authors' experiences and is not meant to represent any particular author, instructor, or workshop.

[3] A phrase she attributes to David Sheridan, 2010.

[4] As with other work influenced by the conversation on multimodality in social semiotics, we use the term "mode" to denote, in Gunther Kress's (2010) words, "socially shaped and culturally given semiotic resource[s] for making meaning," such as "image, writing, layout, music, gesture, speech, moving image, soundtrack and 3D objects" (p. 79).

[5] While the point has been well made that multimodality should not be conflated with digitality (e.g. Palmeri, 2012; Shipka, 2011), digital media have drawn attention to multimodality and are a large part of the changes to the communication landscape that compositionists like Yancey have responded to. Questions about the two, therefore, often co-occur.

[6] From this point forward, we use "communication" over "composition" as a term that can invoke both process and products, artifacts, or abilities.

[7] It is important to note that our inquiry was focused on the U.S. educational context, which traditionally integrates writing instruction in the curriculum quite differently than in other educational contexts, raising a fairly distinctive set of curricular issues.

[8] For a review of literature on multimodality in context of WAC/WID and CxC, see Allan's (2013) analysis of the architecture design critique as a multimodal genre.

[9] Our use of the term "genre" is informed by the work in rhetorical genre studies and Carolyn Miller's (1984) influential definition of genre as "typified rhetorical actions based in recurrent situations" (p. 159). This understanding of genre as a social and rhetorical phenomenon rather than a purely formal one complicated some of our survey design choices, something we address in our Research Design section.

[10] For a discussion of FYC as "gateway" to WAC/WID, see Downs & Wardle, 2007; LaFrance et al., 2013; Linton, Madigan, & Johnson, 1994.

[11] Dating the start of Web 2.0 isn't really possible because features and practices associated with it have arguably been present since the early Web (e.g. website guest books). Web 2.0, then, is more useful to denote the critical mass of accumulated interactive features and practices and attendant cultural shift seen in the early 2000s. The term's popularization is generally attributed to Tim O'Reilly and was intended to denote the rise of the Web after the 2001 dot-com bubble crash (O'Reilly, 2005). The logic of the more interactive, collectively-driven Web-as-platform had arguably reached this critical point in 2004, the date of the first Web 2.0 Conference (now Web 2.0 Summit).

[12] See Downs & Wardle's (2007) "Teaching about Writing, Righting Misconceptions: (Re)envisioning 'First-Year Composition' as 'Introduction to Writing Studies'" for the rationale behind Writing about Writing.

[13] See Adler-Kassner & Wardle's (2015) *Naming What We Know: Threshold Concepts of Writing Studies* for a thorough discussion of threshold concepts.

[14] Our survey received IRB approval in March 2014.

[15] In forming these two broad disciplinary areas, we had to decide where to put faculty affiliated with applied or professional colleges. The humanities and social sciences category is comprised of participants from the College of Humanities and Social Sciences, the College of Education, and the College of Management (the one faculty member from this college indicated affiliation with economics). The sciences category is comprised of participants from the College of Sciences, the College of Agriculture and Life Sciences, the College of Engineering, the College of Textiles, and the College of Natural Resources. A number of colleges, including the College of Design, were not represented in our sample. While we realize others might prefer to categorize faculty disciplinary affiliations differently, we found this approach useful for at least offering a preliminary look at how composing currently compares in these rough disciplinary areas.

[16] It is worth remembering that the frequencies we present here are what faculty report assigning and that students would be likely to report these differently. For a student perspective on the writing that they do, the WIDE report, "The Writing Lives of College Students," is a helpful resource, though it does not engage explicitly with multimodality (Grabill & Pigg, 2010).

[17] We understand that the distinction between technical and professional writing may not be terribly useful. Because of our STEM-heavy campus, however, we felt the distinction might be meaningful to some of our participants. As the help text in Appendix A suggests, we differentiated technical writing from professional writing if its focus was on a technical artifact (e.g. documentation). Future surveys like ours may wish to collapse these categories.

[18] While some of the other types have room for being defined as multimodal (e.g. professional writing might, for some, include a professional design portfolio), we chose to be conservative in what we flagged, generally limiting ourselves to the types that explicitly state "with visuals/multimedia." Some types, such as websites, are so rarely produced with a single mode that we chose to flag these as multimodal as well. While we understand most, if not all, writing and communication as multimodal, we chose to be conservative in our interpretation of these survey results so as not to stray too far from how participants likely read and understood our questions and the selections they were making to represent their own composing and assignments.

[19] Several in this category could arguably be put elsewhere. For example, videos with an academic purpose and audience clearly exist. When making decisions about where to put text types, we chose to use a) the parenthetical examples, and b) the most common understanding of a given text type's purpose to guide us. For example "Installations with a written component" could also be included in the academic category, but because our examples listed museums and agricultural installations, which are commonly used as part of public extension work, we chose to put this in the public category. These are therefore rough and imperfect categorizations and speak to the common polycontextuality of communication types and the open and dynamic nature of categories more generally.

[20] Retrospectively, it would have been more accurate and analytically useful to separate blogs and forum posts from reflective writing and logs, since the former tend to serve a public, rhetorical purpose and the

latter a personal one. Because the word "reflection" cues reflective writing, we chose to place this in the category of reflective writing. Future researchers using our text types as a model may wish to separate these.

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