

Design: Changing Zeitgeists, Changing Communication

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Abstract. Teaching and learning how to communicate effectively is influenced by the zeitgeist of each new age. During each age, changing ideology, culture, and technology reshape communication and necessitate instructional redesign. An examination of communication instruction over the last half century reveals a trajectory toward designing documents using multiple modes of communication — the written, oral, visual, and electronic forms. This study looks at pedagogical change toward designing these artifacts in technical communication. It examines cultural attitudes affecting teaching practices and shows how communication instruction is trending toward visual, design-based methods for training technical writers. Ultimately, learning a design thinking practice is a worthwhile addition for teaching multimodal communication and document design for the digital era.

Keywords: Design thinking, digital communication, multimodality, pedagogy, technical communication, visual literacy

Historically, technical communication classes placed the highest value on form and function of written text. However, visual imagery has long been a part of conveying information about intricate systems, activities, or technologies to those who need it. After World War II, the complexity of emerging technology reached a watershed moment and the need to visually display information challenged text's dominance in North American technical communication curriculum (Connors, 1982). The ability to “read, write and create visual imagery” (International Visual Literacy Association, n.d.) for relaying information grew exponentially in the fields of communication during the 1950s and 1960s. Further, how to teach the use of multiple modes of communication — integrating writing with visual, oral, and electronic forms — called for exploration into a design-based approach to aid technical writing instructors. But, the change toward design-based instruction has not been the focus of much study in the discipline until very recently.

Starting with technical communication as a discipline, it is often labeled difficult to define. Technical communication, like visual literacy,

exists between composition, graphic art, engineering, information technology, the sciences, and other vocational fields (Dobrin, 2004). For many, technical communication is defined by its function to bridge the gap between complex activities, products, or technology and their user-audiences. So, when looking for design in disciplinary activity, we find a growing focus on visual literacy to address inclusion of multiple communication modes (i.e. multimodality) to help audiences. According to the IVLA (n.d.), visual literacy's “visual competencies” are language tools for “communication and inter-action,” which support how “we communicate, exchange ideas and navigate our highly visual digital world.” This focus grew — evidenced by IVLA's evocation of the digital — from changes in technology and cultural zeitgeists. Each zeitgeist, an era defined by “the spirit or genius which marks the thought or feeling of a period or age” (OED, 2018), manifests in the ideas, beliefs, and activities of that time. Each zeitgeist places new demands on communication because cultural sensibilities and ambitions change. Notably, ambitions after World War II led to rapid industrial and technological growth

in the U.S. and brought significant changes to visual language and design in technical communication.

After World War II, Ebbert (2016) posits war-time research practices designing solutions to conflict brought new means for innovation into cultural practice and birthed intrepid ideation. Industry and technology grew and text in technical communication was integrated more and more often with images, drawings, data visualizations, schematics, video, and electronic artifacts. As such, the multiple modes of communication became inextricably linked in the discipline and technical documents became pragmatically connected to changes in the common modes of communication during an era. Multimodal communication design facilitated innovation in documenting technical communication after WWII. This has primed the current subject for study. This book chapter addresses the need to study changes in multimodal design processes in technical communication and its pedagogy as it complements technology and changing zeitgeists.

Empowering the Multimodal in Composing

Moving toward a multimodal composing framework — a frame wherein written, visual, oral, and electronic communication modes are melded together — today's technical communication literacy required the field undergo an ideological evolution. This evolution began in step with the need to communicate technical information visually as much as textually. As society mechanized, the users of machines required more modes of communication than writing for access to necessary information and to improve the usability of new technologies. And yet, Nelms stated that many traditional English departments emphasize written work over multimodal in technical curricula (cited in Connors, 2004, p. 3). Despite this fact, multimodal literacy in composition has become a cultural expectation challenging the dominance of traditional instruction. It is no longer enough to know how to write a message, students must

be literate in the use of visuals, delivery of presentations, and deployment of electronic messages. This cultural challenge serves as exigence to disseminate the power of all the modes in technical communication literacy and pedagogy.

Taking up the task of bolstering visual, oral, and electronic modes alongside writing, many scholars have vouched support. Drucker and McVarish (2012), in their design textbook, discuss how visual, “literate” communication predates character-based, written language by 31,800 years. These pre-historic visuals provided meaning to the much later systems of text. Ong (1982) on oral cultures and literacy espoused a return to oral communication as a dominant form through broadcast media in our technologizing world. Brumberger (2007), addressing electronic communication, denounces the divisive dual knowledge thesis, which devalued the visual in favor of the written, while enriching our understanding of the integration of multiple modes of communication for digital environments. Together these scholars and others have breathed life into supporting communication design work by recommending we develop the intermeshed, multiple core literacies — written, oral, visual, and electronic — of technical communication (see Figure 1) which are at the center of this current scholarship.

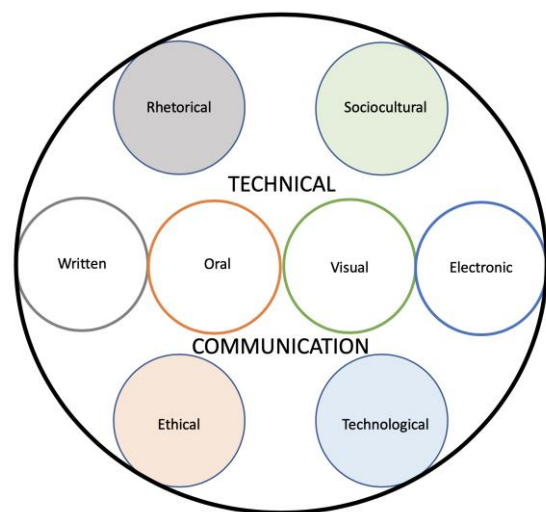


Figure 1. The Multiliteracies of Technical Communication.

The need for developing pedagogical practices for technical communication using a design process geared toward today's multiliterate communication is recognized as a necessary task.

A Design Thinking Process Engaging All Modes

Since the work of Simon (1969), the study of design for problem-solving has been synonymous with communication and innovation. Simon envisioned the design process as a means to devise new ways to address problems via collaboration, observation, foresight, and experiments that may “reframe” our issues and “(re)design the world as it can be” (Dorst, 2010). Since Simon's work, scholars interested in design have sought to refine the process, to distill it for use, and have ultimately arrived at design thinking (Brown, 2009; Faste, 1994; Kelley & Kelley 2013; McKim, 1980; Rowe, 1987). David Kelley — design author and founder of the IDEO design firm — came up with the thinking process which integrated the multi-modal nature of the communicative act with production. A businessman, Kelley devised a cognitive, collaborative, and user-centric process for innovating solutions to business and technical issues of manufacturing, production, and marketing leveraging multifarious communication activities.

In brief, IDEO's design thinking process comprises a series of phases that move from defining a problem through implementing a solution. According to Brown, IDEO Chief Education Officer, the process is “a human-centered approach to problem solving” (cited in Gobble, 2014, p.59). The process “focuses first on the needs and experience of real people... as a source of inspiration and insight” (p.59) for creating artifacts that address the identified needs. Design thinking involves many communication literacies and cognitive activities used to solve technical communication issues. It integrates careful sociocognitive analysis — studies of audience information processing, storage, and application needs and abilities — with scrutiny of the affordances of

communication modes available in the environment where authors are composing for end-users. According to Dorst (2011), design thinking allows for the creation of an exploratory space that provides context control for generating problem-solutions that achieve optimum user affect.

Further, per Tom Kelley, IDEO General Manager, the “Design thinking” which creates this space is a direct, five-part process. It “begin[s] with understanding the client, the market, the technology, and... [the] constraints, and moves through observation of real people in real situations, visualization of possible solutions and users, and prototyping, to end with implementation of the concept” (cited in Gobble, 2014, p.59). This process, as Kelley describes it, illustrates the contexts and communication processes central to developing effective user-based technical documents. The IDEO design thinking process is suitable for technical communication pedagogy and its uptake of sociocognitive influences to offer solutions to difficult problems of communication is highly sought after.

Moving toward Design Pedagogy via Technical Communication's Past

As society and economy change, arriving at today's design pedagogy in technical communication did not happen overnight. There is a long history of ideological and methodological adjustment influenced by cultural zeitgeists that led to the value of multiliteracies and design. In outlining the evolution of technical communication pedagogy given design thinking instruction, the author adopted the perspective used in Doheny-Farina's (1986) research that a micro-level examination of key elements can produce cultural insight into the whole. Also, using the methods by Geertz (1965), he assumed that individual, timely practices can represent the height of a cultural moment. Accepting these views, I map the evolution of key ideologies, principles, and practices in the history of communication design from the mid-twentieth century to the present day (see Figure 2).

This chronological tracing is important because it allows the development of design thinking practices and their relationship with technical communication to unfold. Arriving in the present, the author considers how design pedagogy is related to technological progress

and the ideology of modern innovation centralized in the spirit of our digital age. A final remark offer a forward look upon design thinking and the future of professional, technical communication instruction.

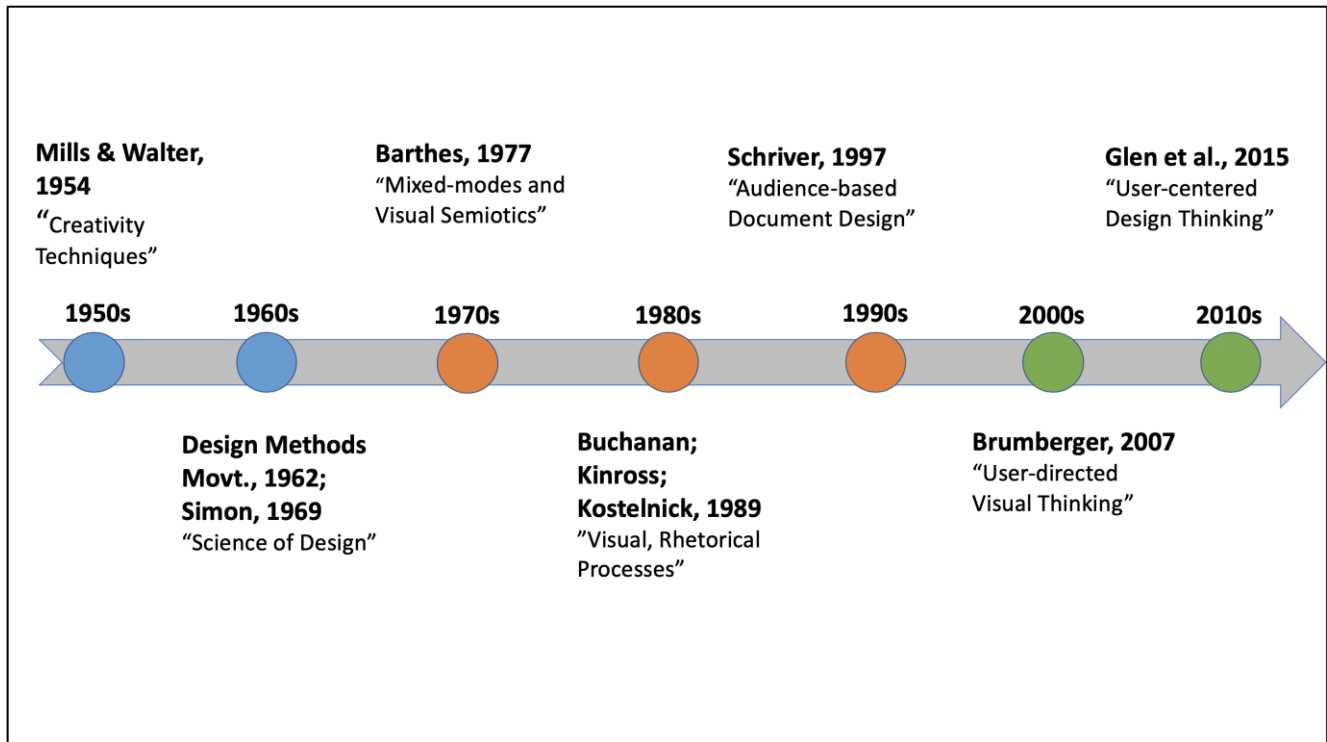


Figure 2. A timeline showing this study's central authors and concepts contributing to design evolution in technical communication since WWII.

Evolving from Text Theory-based to Cognitive User-Based Design Pedagogy

Until the mid-twentieth century, technical communication instruction was usually text-based and dependent on composition practices. According to Connors (1982), though "technical writing is ancient, ... systematic instruction in the methods of technical writing" (p.4) did not exist until after a pivotal publication by Mills and Walter in 1954. During the post-war era, "technical writing 'grew up'" (p.13) alongside scientific communication. Exchanges between

these fields began to address visual literacies and communication design practices using "creativity techniques" (Cross, 1993, p.16). From this zeitgeist — defined by a culture seeking creative, technological designs to enhance everyday experiences — the evolution of technical communication away from writing towards visual and electronic modes began. However, even though the change favoring design and multimodality started in this time, resistance was fierce.

In the 1980s, educators in technical communication clung to textual models of teaching visual literacy and design for multimodal communication. Scholars like Buchanan

(1989), Kinross (1989), Ehse (1989) and other figures of design discourse were basing visual scholarship on models of textual rhetoric and semiotics from Barthes (1977), Saussure (1959), and their predecessors. While textually informed concepts of visual rhetoric are still with us, the 1960s and 1970s Design Methods Movement embraced a scientifically-minded and techno-logically changing climate in technical communication. The movement ushered in pedagogical changes and ideological shifts toward teaching visual literacy and communication design as a systematic, cognitive process.

According to Cross (1993), the 1962 *Conference on Design Methods* held in London — what many consider the inaugural event for design practices as processes — started the Design Methods Movement. This movement articulated a reimagining of design instruction as a “scientific process” for the creation of “new structures,” (p.18) and rebranded the romanticized labors of the designer as practical, systematic activities — practices relatable to technical communication. This movement and its motivations grew out of a zeitgeist which had seen “the application of novel, ‘scientific’ methods” and “creativity techniques [of] the 1950’s” (p.16). Into the 1970s, these practices drove the embrace of a creative, albeit empiricist, paradigm from science in technical communication, graphic art, engineering, and architecture.

During the 1970s, from Alexander and Jones’ “scientifically methodological [design] approach” (Cross, 1993, p.18) arose an objective, linear process of design. By emphasizing that design methods are patterns of systematic activity for invention, and that this methodology is focused upon “how things ought to be” (p. 18), design in this era took on an air of legitimacy and it reached for new idealistic heights. These sentiments recognized the design process movement’s desire for both recognition and change echoing the anti-establishment fervor of period academic and social environments. Designers at this time believed a scientific process could not only reinvent the methods of

their field, but it could also boost their creativity and move them away from traditional artful practices. To accomplish these goals, members of the movement applied their forerunners’ approach to design to innovate their praxis.

According to Cross (1993), the pedagogy behind the scientific method of design was conceived to make the work more approachable by providing stages with distinct functions. By staging and externalizing activity, technical communication educators who used the method were afforded means to examine a technical document at every step in its composition and determine if it was achieving its purpose. In total, the methodological concept of “scientific design” offered a way to “improve our understanding of design through ‘scientific’ (i.e., systematic, reliable) methods of investigation” (p.21). Therefore, from this method’s systemization, a technical writer learned a process for design, what may be achieved from each part of that process, and what successful document components to assimilate into their labors.

So, resultant from the scientific method of design in practice, an analytic, observational approach to teaching visual communication design as a process is offered up to later iterations of sociocognitive-based pedagogy. Going into the 1990s, technical communication ideology again underwent a pronounced change as the post-industrial era began. Kostelnick’s (1989) article on the processes of design and composition as “natural counterparts” (p.267) brought design work and visual literacy still further into the fields of communication and began to orient them toward readers just as computer-mediated communication took solid hold in many of our classes. With the dissemination of the personal computer, and its effect on design and document production, the field was set to change drastically, while social constructionist, user-centered scholarship and instruction became centralized in communication.

The zeitgeist of the 1990s in technical communication design is best observed in the scholarship, research, and pedagogy of Karen

Schraver. Schriver's (1997) textbook *Dynamics in Document Design* is an apt lens upon the teaching of visual communication and multi-modal design. In the book, she provides scholarship centered upon peoples' experience with "documents [and] technology" (p.1) in terms of design quality and response. From these considerations, she provides numerous user-based research studies that impart the importance of discovering "reader's needs," recognizing their "goal's and values" (p.11), and articulating feedback into usable designs. The focus of Schriver's work on the visual design of technical documentation from the reader's point of view — the recognition of audience as the primary motivating force for effective communication — defines the zeitgeist of the 1990s and resulted in her pedagogical model for visual communication.

PAM or *Protocol-aided Audience Modeling* (Schriver, 1997) is a teaching method developed to help students discover reader issues with a document's design and aid intuiting user-based revisions. With the development of computer-aided communication between designers and consumers in the 1990s, the importance of utilizing user response for design and redesign steadily increased. To meet demand, PAM teaches communication designers to interact with perceived audience problems during document design activity. The primary goal of this instruction is to teach designers to anticipate user problems and resolve them before they occur. To that end, Schriver states that through PAM, she sought "to improve document designers' sensitivity to reader's needs" (p.475), and her method did so without direct, face-to-face interaction between readers and designers. For example, Schriver's methodology would be well-suited for developing a technical user manual FAQ section, where the communication designer is attempting to provide solutions for problems readers are likely to experience.

Ultimately, the PAM method of instruction was a precursor bridge to Brumberger's (2007) teaching visual literacy of design and visual thinking processes. Two evolving traits that con-

nect Schriver's (1997) ideas to Brumberger's practices are the shift in focus from intuiting reader's needs to open communication of users' needs, and the development of visual communication practices from a general process of revision to a flexible, demystified problem-solving, design-centric scenario. Endeavoring to teach visual thinking processes to aid visually-centered, audience-based design in the era of digital, technical communication, Brumberger's work exemplifies the practices during the first decade of the new millennium.

In the 2000's, the zeitgeist in communications culture took on a new dimension in terms of ideology. The ideological shift was cemented by significant changes in internet technology and more widespread focus on visual literacy. Brumberger's (2007) approach aligns with the development of the Web 2.0 environment. Internet communication became prominently visual, passive readers became users of information media, and instantaneous, simultaneous communication across multi-modal multimedia platforms emerged. Also, alongside communication barriers being reduced, pedagogical exchange between visual disciplines (such as art, graphic design, and engineering) and technical communication were markedly more accepted by institutions because of the increasing multimodality of communication environments. As the result of these changes, the visual became — more than ever before — a culturally significant subject of study that could not be easily sidelined by communication traditionalists.

Additionally, in terms of pedagogical impact, whereas Schriver's PAM (1997) sought to educate designers to preempt readers' problems, adoption of instant communication during the digital zeitgeist nearly eliminated communication latency between designers and users. This caused practices like Brumberger's (2007) to adapt by incorporating visual design and multi-modal training with rapid-critical-feedback exchanges befitting the web-connected classroom. In Brumberger's pedagogy, the new zeitgeist in technical

communication played a significant role in how she considered visual communication and design alongside evolving relationships of the designer and audience.

Brumberger's (2007) pedagogical approach to teaching "visual thinking" processes, unlike Schriver's (1997), is not focused on learning to intuit readers' problems in familiar, systemic ways. Rather, her instruction begins by focusing on "demystifying design" (Brumberger, 2007, p.391). Brumberger defines visual thinking for students — based on McKim's earlier concept — as "an active and analytical process of perceiving, interpreting, and producing visual messages, an interaction between seeing, imagining, and drawing that is as purposeful, recursive, and sophisticated as verbal thinking" (p.381). She teaches audience analysis alongside the problem-solving activities many designers use (e.g., drawing, sketching, drafting) during the design creation process to enact her demystification. It is compelling to note here, how far reaching these designer activities have become in communications courses. At Iowa State University for example, where multimodal composition practices are used, developing technical writers compose visual communications using these same techniques. As such, they are enhancing their sense of visual design alongside the other communication modes. Brumberger employs designer-centric activities to teach students how to discover solutions via visualization of communication best suited to addressing design issues for the user's sake, which is being incorporated by the field.

Last, Brumberger (2007) endeavors in "developing flexibility [of] thought...[by] teaching students to look and see in new ways" (p.394) with real-time feedback from users and by learning the design "tools of the trade" (p.397). For Brumberger, this means training to work with the audience and preparing the mind and the hand before employing computer-aided technologies for composition. Brumberger's visual literacy and communication design pedagogy moves beyond her predecessor in

terms of clarifying design activities and teaching cognitive flexibility for problem solving techniques of the profession. However, the goal of her visual thinking research was not to articulate design thinking processes as a new pedagogical approach. So, moving from her cognitive insights, design thinking practices may bring more aspects of the current communication zeitgeist into play for teaching.

User-Centric Design Thinking Practices and Today's Zeitgeist

In the current era, we have seen technological progress accelerate at its fastest rate ever. Communications technologies seem to come and go with the seasons, each trying to engage all our senses. In the computer-aided design landscape, dynamic changes to communication artifacts occur in a flurry of real-time updates. But, the ideology and methods behind the creation of these artifacts are slower to adapt. Despite this slothfulness, the ceaseless flood of progress is geared toward user-audiences who are ready, waiting, and willing to participate in the development of the communications they want and need. "*Innovate! And, design for the user first!*" have become the calls to action to address the flood and design thinking processes may answer these calls.

Behind user-prompted interactive tutorials and multimodal hyperlinked training documentation, design thinking processes may aim to bring the technical communicator together with the user. According to the Design Council (2011), design thinking not only "generate(s) new ideas," but encourages planning around "user needs," to change the social dimension of design by capitalizing on "creative... opportunities." To point a fact, studies of UX (user experience), UI (user interface), and UBP (user-based planning) initiatives are developing into centralized forces for change behind the call for savvy solutions to issues in technical communication. This powerful innovative force is inextricably linked to

the zeitgeist of the digital age where individuals' attentions are ever focused on the next thing to come out of the design pipeline, how to make it work for them, and how it may improve their experiences of the world.

Aiming to make the keenest iteration of design thinking — and drawing the attention of many UX, UI, and UBP communication studies — the work of IDEO's David Kelley stands to the fore. His design thinking process is defined as "a human-centered approach to problem solving" (Gobble, 2014, p.59) that uses a duplicable process to achieve innovation for our "highly visual digital world" (IVLA, n.d.). It befits computer-mediated design environments where we are working to meet the needs of today's end-users. Information Technologies specialist Peter Denning (2013) states, "Design [thinking] is a process where we create and shape artifacts that solve problems [for users]" (p.29). This zeitgeist-driven goal is at the center of design thinking as a process. Users have problems and design thinking may help accelerate savvy, appropriate solutions utilizing the affordances of communication technology.

In the current ideology of technical communication, the creation of artifacts is similar activity to software and product designers as they are developing solutions for end-users. Denning (2013) correlates the process of design thinking with developers work stating, "design means crafting software that... *does the jobs users want done*" (p.29), a mantra known to technical writers familiar with Patrick Moore's (1996) "instrumental discourse" (p.100). Design thinking processes in technical communication may borrow from earlier pedagogies emphasizes on problem solving, user-feedback, and engaging visual literacy and multimodal communication for "getting things done" (p.115) for users in the digital age. To this collection of attributes, design thinking adds a new system of cyclical practices (not unlike writing) aiming directly at discovering innovative ends befitting current communication attitudes.

One usable, relevant design thinking model for communication is IDEO's five-step practice. In the contexts of technical communication, the model may help make sense of a problem, define and structure response to the artifact in need of attention, aid brainstorming and creation of solutions, support drafting multiple artifact versions for feedback, and culminate in the selection of the best option via review and testing with real end-users (See Figure 3).

This five-phase procedure for innovative design — developing an organic fit with our own discipline through the seeds sown by the Design Methods Movement, Schriver (1997), Brumberger (2007), and others — may culminate in an acceptable form of visual document design practice. This model practice — mirroring writing activity in its cyclic, recursive nature — already has a foothold in business communication through the use, research, and published studies of a devoted cohort of business scholars.

Business scholars such as Glen, Suci, Baughn, and Anson (2015), are avid users of design thinking in their business communication courses. Each use the process to prepare students for workplace-based projects. This preparation happens by equipping learners with multi-literacies and design process skills required to innovate communication designs dependent on the needs of clients and end-users. While using the model, students form collaborative design teams to draft problem statements, communicate with design-users, brainstorm solutions to problems, visualize solutions and respond to them, and conduct multimodal prototype analysis, before concluding with presentations of optimum solutions and reasons for implementation. From the use of IDEO's five-phase process (Glen et al., 2015) and attention to teaching multiliteracy and socially informed design skills, technical communication may be well-served by assimilating design thinking for document design work and user-based innovation.

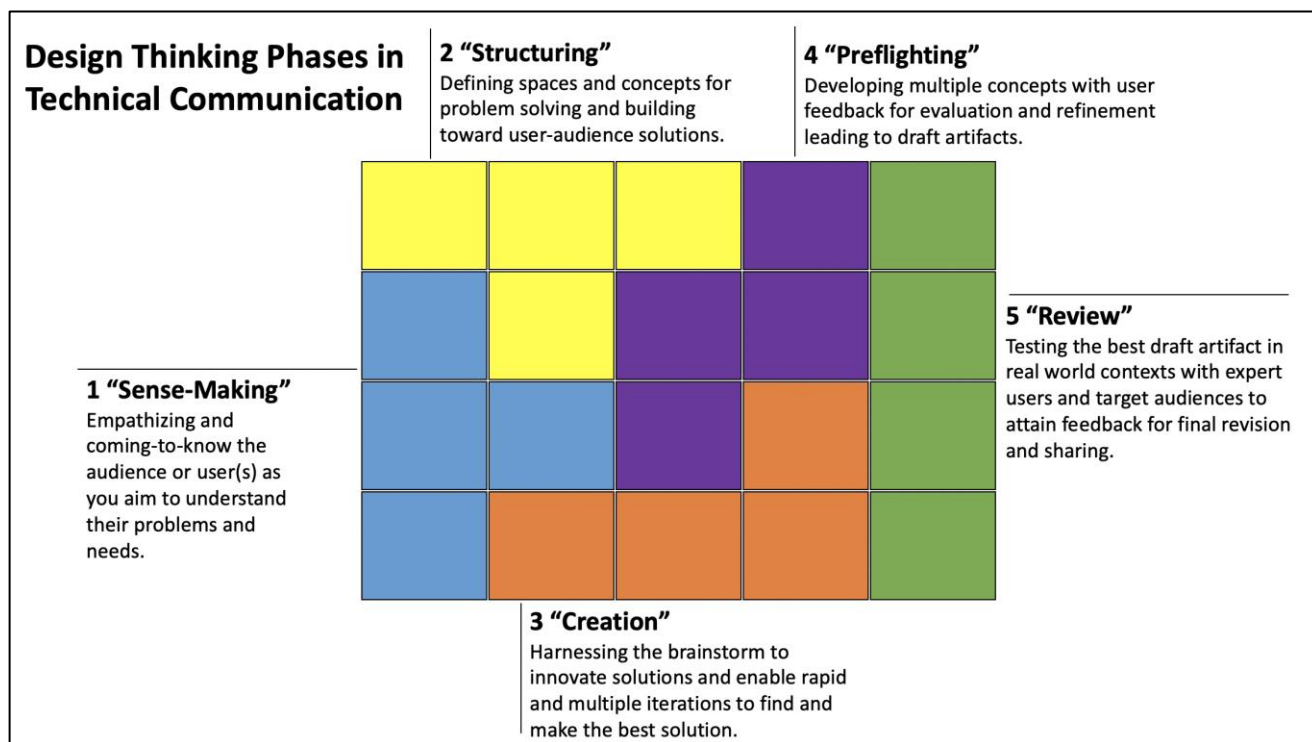


Figure 3. Visualizing design thinking in terms of technical communication.

By including the aforementioned practices (Glen et al, 2015), technical communication may benefit by designing documents with end-users and working toward shared goals. Design thinking adds real-time observation for establishing problems (going past Schriver's model), and it extends beyond demystifying visual communication and using designer tools (seen in Brumberger) to include prototyping and real-user observations to meet the needs of the ideal triumvirate, "the client, the market, and the technology" (Gobble, 2014, p.59). As a concept for pedagogical practice, design thinking offers means for design instruction befitting the socio-cognition, intersubjectivity, and multimodality in technical communication. It not only has links to ideology and methodology already represented in professional communication, but given the attributes of the current zeitgeist, it seems a culturally relevant addition to practice.

Design Thinking Practices in the Future of Technical Communication

By using design thinking informed pedagogy in technical communication, scholars may directly address some of the attitudes and ideals of the current era. The pressing importance of multi-literacies and multimodality for communication design innovation in our zeitgeist makes design thinking pedagogy a potentially valuable addition. With a focus on end-user needs to direct technical document design, cognizant design processes attending to these needs may offer a lot to teaching successful communication practice. Additionally, increased attention to today's multimodal designs strengthens the importance of teaching visual literacy in the profession in a manner supporting the growing value of visuals in our modern digital world.

Furthermore, in terms of design thinking's suitability, recent research on the processes' effectiveness shows promise for its ability to prepare students for the workforce. According to Razzouk and Shute's (2012), "Design thinking, systems thinking, and teamwork skills" (p.2) are foundational topics for successfully introducing today's students to the demands of tomorrow's workplace. This realization warrants the inclusion of these items in technical communication and design instruction. Given how design thinking practice compliments the current zeitgeist, it rings true that it may be an addition to technical communication pedagogy we should consider carefully.

Also, it is important to note that of the three items on Razzouk and Shute's (2012) list, design thinking is the only one which often involves the other two, systemic cognition and collaborative skills. As a part of client-based design thinking projects in technical communication, students learn to navigate the interdependent structures of a dynamic system comprised of "the client, the market, the technology" (Gobble, 2014, p.59) and project limitations, while collaboratively designing a solution to a communication problem. Regarding teamwork, the design thinking process compliments problem-through-solution learning in educational environments with the development of a design team working together leveraging their collective multiliteracies toward discovering the best solutions to assigned problems. This team dynamic replicates Killingsworth and Jones' (1989) integrated team concept which optimizes workflow and mimics the design practice work-place environment envisioned by IDEO. The design thinking activity offers technical communication a tool for teaching practices that nurture problem solving and how to work together to design communication solutions.

Positive Implications of Using Design Thinking in Business

Adding to the established potential of design thinking, researchers in business communication (Glen et al, 2015) offer more positive implications of its pedagogical inclusion. Students who learned to use the design thinking process developed skills in four areas important to core competencies in technical communication:

- 1) Students acquired skills that "dealt with...coping with ambiguity, intense engagement in generating ideas, and the repetitive process of [analyzing] diverging and converging [concepts],"
- 2) Students learned the "ability to work with multidimensional contexts and solutions" in "active...real world situations,"
- 3) Students "focused on learning and using specific tools and methods [for communication]," and
- 4) Students developed "interpersonal skills" (Glen et al., 2015, p.190).

Teaching a design thinking pedagogy may complement many technical communication goals, while also priming students for a practice they may encounter in the workplace.

As a form of design-based socio-cognitive instruction, learning design thinking processes may equip students with skills for solving complex communication problems when designing documents for real end-users after graduation. The process itself — when compared to its predecessors — is likely to produce positive results with the documentation's user-base through its inclusive strategy. Also, the use of design thinking in established technical communication curriculum may meet learning objectives already present. Design thinking seems to offer a tool for teaching real-world practice that prepares students for addressing

complex problems, innovating work-able solutions to communication issues, and may ultimately help produce innovative documents for complex, future communication scenarios.

Conclusion

Redressing the problem that brought design into technical communication — the dominant status of text and the need for multimodality — I see design thinking research and modeling as a practice which may help balance modal value and teach to current cultural needs and expectations. Also, communication design philosophy and design thinking practices, evolving from half a century's zeitgeists, seem to earn a space in technical communication pedagogy in so far as they respond to the exigencies of today's technology and zeitgeist. However, this research only begins to scratch the surface of the ideological history and practices behind communication design. The cultural attitudes, their effect on technical communication instruction, and their links to visual literacy and multimodal inclusion provide much for more exploration and analysis.

In so far as this document begins to wade through the history, connecting the points of correlation in concepts, practices, and cultural attitudes that proceeded and proffered cognitive design and multimodality, The author has developed herein but a partial vision. The vision, based on Doheny-Farina's (1986) idea that "a microscopic investigation of important parts of a culture can elicit an understanding of that culture" (p.160), and that practices, according to Geertz (1965) can be understood "as a unique, individual, peculiarly eloquent actualization — an epitome — of [the culture]" (p.154), leaves much undiscovered. While the author endeavored to extract the whole of design thinking and its ideological history from a series of cross-sections, this work elicits a need for more breadth and depth. However, only by plotting this course will others come to discover what the author might have overlooked. More

design thinking research in technical communication and beyond is needed to contribute to our continued communicative success.

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