

21. Multimodality

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On its surface, *multimodality* has a relatively basic meaning within technical communication. To paraphrase the definition of the New London Group (1996), there are multiple modes by which to represent a message (print-linguistic, *visual*, audio, gestural, spatial), and any two or more of these modes can be combined to form a multimodal representation (p. 60). Thus, on its most basic level, the term *multimodal* means any combination of modes of representation to create a single artifact, and multimodal artifacts are the norm rather than the exception in technical communication practice. An example of such an artifact would be a training or instructional video that combines visual (images of people, graphics, and/or objects), audio (a voice-over or someone speaking), and gestural and spatial (a person demonstrating how to perform a given task) modes of representation.

Multimodality's historical development relative to contextual uses within the field, even as technical communication developed as a recognized discipline, complicates its treatment as a keyword. The term has been used relatively commonly since the mid-1990s; however, the concepts associated with it go back to early studies in *literacy* and even earlier scholarship in *rhetoric* and semiotics. Further, the various ways it is studied evolve as new technologies emerge. Its connections to rhetoric, literacy, and media technologies shape and complicate its treatment as a keyword in technical communication scholarship, *pedagogy* and practice.

Though not termed as such, multimodality is treated within the classical rhetorical scholarship of Aristotle (1991) and Quintilian (1922) as part of delivery. They recognized the importance of using gesture in conjunction with oration in persuading an *audience*. That is, gestures and facial expression are visual/non-verbal actions that carry meaning and can enhance or complement oral communication. Subsequent generations of rhetorical theorists continued to study delivery-related implications for messages as communication technologies from the printing press to hypertext offered new ways to present multiple modes (see McCorkle, 2012). Rhetoric, as an academic discipline, has longstanding links to the field of technical communication; thus, it is not surprising that technical communication theorists had also taken up issues of multimodality long before the coining of the term.

Initially, technical communication scholars identified the use of multiple modes of representation in technical documents without using the term *multimodal*. Many of these studies focused on workplace literacy practices—how professionals communicated with each other in workplace settings and elements of page *design* (see, for example, Doheny-Farina, 1988; Odell & Goswami, 1985).

Some reviewed how graphics were used in those documents. For example, in a review of technical communication practices, Mary Beth Debs (1988) noted that writers tend to supplement text with graphics, acknowledging that “pictures serve additive function” (p. 19). Manuals are a common artifact discussed within technical communication; these often combine print-linguistic text (words) and visual elements. For example, Davida Charney et al. (1988) illustrate how the “minimalist manual” should include illustrations of examples of tasks (pp. 70–72), and John Carroll et al. (1988) show a visually appealing page design as an attribute of the “minimalist manual” (pp. 82, 85). Stephen Bernhardt (1986) describes the visual rhetoric of headings, print quality, and white space within a print-text fact sheet pertaining to wetlands and designed for multiple audiences—legislators, teachers, students, and the general *public* (pp. 71–72).

Transitioning from purely document-related consideration of multiple modes of representation and related analyses, scholars began looking more closely at multimodal forms of communication connected to technical communication practices beyond print documents in the late 1980s and into the 1990s. Muriel Zimmerman and Hugh Marsh (1989), for example, studied how storyboarding facilitated *proposal* development within a particular company. Further, Carroll et al. (1988) considered how hands-on instruction may affect learning within workplace settings.

As mentioned previously, the New London Group (1996) was among the first set of scholars to formally recognize and define the term *multimodality*. As the number of digital composing technologies increased and became more widely used, scholars encouraged recognition of multiple forms of literacy within a growing set of tools to use for creating messages and encouraged pedagogy that included literacy with those tools and forms of representation.

The study of multimodal rhetoric evolved in the early 2000s, as scholars shifted their focus from examining how technical communicators presented *information* in multimodal ways to understanding how various modal combinations affected audiences’ ability to understand a message relative to technical communication purposes. Linguists Gunther Kress and Theo Van Leeuwen (2001, 2006) attempted to develop a theory of semiotics that integrated terminology that could describe the various rhetorical dynamics at work in multimodal forms of communication, facilitating rhetorical analyses of multimodal artifacts. This “grammar” of visual design (Kress & Van Leeuwen, 2006) has been used by many within scholarship of multimodality; a cursory review of Google Scholar in May 2020 finds that this work has been cited over 14,800 times, indicating its value as a theory of analysis for multimodal messages.

Other lines of *research* have focused on the benefits of multimodal communication for teaching and learning. Roxana Moreno and Richard Mayer (2000) found that certain combinations of visuals and text information affect cognition, particularly related to learning, suggesting a relationship between modes used to communicate and their rhetorical impact. In an instructional context, combining

visual and audio modes of representation is more powerful for accomplishing the instructional purpose than using only audio narration or visuals alone. Mayer (2001) summarized their multimodal principle with the statement that people learn better when pictures and words are integrated into an instructional message than when only words are used (p. 63). If a picture is provided, people can make a visual connection more readily. Mayer also asserts that it is vital to eliminate extraneous material—words, images, and sounds—from any multimedia message. Such irrelevant information “competes for cognitive resources in working memory,” disrupting the learner’s ability to organize and retain relevant information (p. 113).

Technical communication scholars have, also, examined the relationship between multimodal artifacts and cognition. Jonathan Buehl (2016) calls attention to theories from multiple cognitive scientists that link to multimodal theory as applied to scientific texts. Wolfgang Schnotz (2005) reviewed several studies pertaining to the influence that working memory has on learning with multimedia, and she develops a model of text/picture comprehension that considers working memory. Visual images that integrate text are easier to process because fewer processes of working memory are involved. According to Alan Baddeley’s (1986) model of working memory, there is a phonological (auditory) channel and a “visuo-spatial” (visual) channel associated with short term memory. By facilitating use of both channels, people can better process information than they can when too much of one system is used. This helps technical communicators design products that balance elements affecting cognition, improving an audience’s ability to understand the message.

James Paul Gee (2003) connected literacy theory to multimodal practice, identifying a marriage between the semiotic domain and situated practice (p. 26). Gee argued that, as part of audience consideration, it is important to understand modes in which trainees have learned previously. So, some studies have considered relationships between modal combinations relative to multiliteracies and technical communication rhetoric relative to development of instructional materials. Matt Morain and Jason Swarts (2012), for example, allude to using students’ “digital literacy” to develop an understanding of how to assess and create YouTube videos for instructional purposes (p. 6).

As these studies occurred, advancing multimodal theory relative to technical communication, teachers began integrating multimodal concepts and approaches into their classroom practices. A body of work emerged from studying such instruction (e.g., A. Bouelle et al., 2015; T. Bouelle et al., 2017; Katz & Odell, 2012). These studies range from helping students understand the possible uses of different media to compose technical communication products to how one may apply criteria—old and new—in assessing multimodal products developed by students. In their introduction to a special issue of *Technical Communication Quarterly*, for example, Susan Katz and Lee Odell (2012) acknowledge that “Confronted with the full range of affordances of digital media, we need to achieve a level of clarity that will help students wisely use these affordances” (p. 2). Andrew Bouelle et

al. (2015) describe ways teachers can help students apply the rhetorical canons of invention, arrangement, *style*, delivery, and memory to composing in new digital media. Cheryl Ball (2012), Christa Teston et al. (2019), and Pamela Takayoshi and Cynthia Selfe (2009) describe factors to consider in assessing multimodal work, including students' self-reflection of why they chose to use certain media with which to compose a message and the media's abilities and limitations. This reflection can help one understand how to select composing media for future projects relative to information that should be included and how to best represent that information given access to multiple modes of representation.

As reflected in the historical development of its treatment, scholars shifted between labelling the use of multiple modal combinations as *multimodal* and *multimedia*. As indicated above, *multimodality* increased in use as a term with the rapid development of various technologies that facilitated integrating multiple forms of representation in them. Moreno and Mayer (2000) demonstrate this synonymous use while describing studies of participants reacting to messages that included text and images. While the majority of their analyses revolve around performance of subjects relative to modal combinations, they use the term *multimedia* throughout their work. In concluding their article, they write,

To foster the process of integrating, multimedia presentations should present words and pictures using modalities that effectively use available visual and auditory working memory resources. The major advance in our research program is to identify techniques for presentation of verbal and visual information that minimizes working memory load and promotes meaningful learning. (n.p.)

Scholarly publications in technical communication theory and pedagogy illustrate the favoring of the term "multimodality" in academic settings (e.g., Armfield et al., 2011; A. Bourelle et al., 2015; T. Bourelle et al., 2017). Stephen Frailberg (2012) and Dirk Remley (2015, 2017) illustrate favoring "multimodality" in case studies of practices, using the term "multimodal" instead of "multimedia" throughout their works, even including the term in the title of their works.

S. Scott Graham and Brandon Whalen (2008) illustrate the conflation of the two terms relative to a case study of a web designer's practices. They state, "The possibility of plurality in descriptions of digital communication media and *genres* has helped to generate a broad host of heteroglossic and hybrid theories, as well as an assortment of multi-prefixed neologisms (multimedia and multimodality being the most prominent)" (pp. 66-67). Claire Lauer (2009) found that "multimedia" is used by some in academia and tends to be the preferred term in industrial contexts to describe the same artifact (p. 231). Consequently, she states that instructors and scholars need to use multimedia "as a gateway term" when interacting with practitioners (p. 225). It is interesting to note, relative to the Graham and Whalen (2008) article, that Graham is a technical communication scholar, while Whalen is a practitioner.

Several scholars, including Rich Rice and Carol Clark Papper (2005), Lauer (2009), and Andy Lucking and Thies Pfeiffer (2012), differentiate the two terms, though. These scholars state that multimodality describes the sign systems used to make meaning, while multimedia pertains to the tools by which such artifacts are distributed. Lucking and Pfeiffer (2012) state that “multimodality in a message is perceived as integrating more than one sensory interface and is perceived as multimedia if the message is conveyed using more than one medium” (p. 593). For example, software that facilitates creation of video that includes audio is multimedia. The video product itself is considered a multimodal artifact by most involved with technical communication in academia. Some have assessed the effectiveness of various media available to present technical information multimodally (e.g., Tufte, 2003); however, these studies focus on the media’s technical and design capabilities and limitations.

Evolving from the study of the effects certain modal combinations may have on cognition, more recently, scholarship has begun considering neuroscientific or biological analyses associated with multimodal artifacts and related effectiveness relative to rhetoric. For example, Dirk Remley (2015, 2017) examines how multimodal artifacts used in technical communication settings affect neural dynamics to influence meaning and response. Examples included in his analyses range from website design and public service announcements to nurse and pilot training. Such consideration helps to show the biology of cognition with multimodal products, or why certain multimodal combinations are effective for certain audiences, which can help technical communicators design better materials.

Additionally, with the proliferation of video-gaming as an industry and its related value in developing remote control tools and practical skills, technical communication scholars have been studying its multimodal designs and uses for classroom activities and uses in industry (see, for example, Cata, 2017; Cooke et al., 2020; McDaniel & Dear, 2016; Robinson, 2016; and Vie, 2008).

As a concept of communication, multimodality complemented traditional notions of writing and composing. As noted above, the integration of graphics into technical documents was generally regarded as valuable practice; so, initially, multimodality fit well into technical communication analyses and pedagogy. Today, it has grown into a valued concept in technical communication. To a certain extent, it competes with the term “multimedia” synonymously when used in industry by technical communication practitioners.

■ References

- Anderson, P. (1984). What technical and scientific communicators do: A comprehensive model for developing academic programs. *IEEE Transactions on Education*, 27, 160–166. <https://doi.org/10.1109/TE.1984.4321691>
- Aristotle. (1991). *The art of rhetoric* (H. C. Lawson-Tancred, Trans.). Penguin.
- Armfield, D. M., Gurak, L. J., Kays, T. M., & Weinberg, J. (2011). *Technical*

- communication education in a digital, visual world*. IEEE. <https://doi.org/10.1109/IPCC.2012.6408637>
- Baddeley, A. D. (1986). *Working memory*. Oxford University Press.
- Ball, C. E. (2012). Assessing scholarly multimedia: A rhetorical genre studies approach. *Technical Communication Quarterly*, 21, 61-77. <https://doi.org/10.1080/10572252.2012.626390>
- Bernhardt, S. A. (1986). Seeing the text. *College Composition and Communication*, 37, 66-78. <https://doi.org/10.2307/357383>
- Bourelle, A., Bourelle, T., & Jones, N. (2015). Multimodality in the technical communication classroom: Viewing classical rhetoric through a 21st century lens. *Technical Communication Quarterly*, 24, 306-327. <https://doi.org/10.1080/10572252.2015.1078847>
- Bourelle, T., Bourelle, A., Spong, S., & Hendrickson, B. (2017). Assessing multimodal literacy in the online technical communication classroom. *Journal of Business and Technical Communication*, 31, 222-255. <https://doi.org/10.1177/1050651916682288>
- Buehl, J. (2016). *Assembling arguments: Multimodal rhetoric & scientific discourse*. University of South Carolina Press. <https://doi.org/10.2307/j.ctv6wgf3>
- Carroll, J. M., Kerker, P. L. S., Ford, J. R., & Mazur, S. (1988). The minimal manual. In E. Doheny-Farina (Ed.), *Effective documentation: What we have learned from research* (pp. 73-102). MIT Press.
- Cata, A. (2017). *Playing with usability: Why technical communicators should examine mobile games* (Publication No. 5395) [Doctoral dissertation, University of Central Florida]. Electronic Theses and Dissertations. <https://stars.library.ucf.edu/etd/5395>
- Charney, D. H., Reder, L.M. & Wells, G.W. (1988). Studies of elaboration in instructional texts. In E. Doheny-Farina (Ed.), *Effective documentation: What we have learned from research* (pp. 47-72). MIT Press.
- Cooke, L., Dusenberry, L., & Robinson, J. (2020). Gaming design thinking: Wicked problems, sufficient solutions, and the possibility space of games. *Technical Communication Quarterly*, 29(4), 1-14. <https://doi.org/10.1080/10572252.2020.1738555>
- Debs, M. B. (1988). A history of advice: What experts have to tell us. In E. Doheny-Farina (Ed.), *Effective documentation: What we have learned from research* (pp. 11-24). MIT Press.
- Doheny-Farina, E. (Ed.). (1988). *Effective documentation: What we have learned from research*. MIT Press.
- Frailberg, S. (2012). Reassembling technical communication: A framework for studying multilingual and multimodal practices in global contexts. *Technical Communication Quarterly*, 22, 10-27. <https://doi.org/10.1080/10572252.2013.735635>
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. Palgrave MacMillan.
- Graham, S. S., & Whalen, B. (2008). Mode, medium and genre: A case study of decisions in new-media design. *Journal of Business and Technical Communication*, 22, 65-91. <https://doi.org/10.1177/1050651907307709>
- Katz, S. M., & Odell, L. (2012). Making the implicit explicit in assessing multimodal composition: Continuing the conversation. *Technical Communication Quarterly*, 21, 1-5. <https://doi.org/10.1080/10572252.2012.626700>
- Kress, G. (2003). *Literacy in the new media age*. Routledge. <https://doi.org/10.4324/9780203299234>
- Kress, G., & Van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. Arnold.

- Kress, G., & Van Leeuwen, T. (2006). *Reading images: The grammar of visual design*. Routledge. (Original work published 1996)
- Lauer, C. (2009). Contending with terms: "Multimodal" and "multimedia" in the academic and public spheres. *Computers and Composition*, 26, 225-239. <https://doi.org/10.1016/j.compcom.2009.09.001>
- Lucking, A., & Pfeiffer, T. (2012). Framing multimodal technical communication. In A. Mehler & L. Romary (Eds.), *Handbook of technical communication* (pp. 591-644). Walter de Gruyter. <https://doi.org/10.1515/9783110224948.591>
- Mayer, R. E. (2001). *Multimedia learning*. Cambridge University Press.
- McCorkle, B. (2012). *Rhetorical delivery as technological discourse: A cross-historical study*. Southern Illinois University Press.
- McDaniel, R., & Dear, A. (2016). Developer discourse: Exploring technical communication practices within video game development. *Technical Communication Quarterly*, 25(3), 155-166. <https://doi.org/10.1080/10572252.2016.1180430>
- Morain, M., & Swarts, J. (2012). Youtuorial: A framework for assessing online instructional video. *Technical Communication Quarterly*, 21, 6-24. <https://doi.org/10.1080/10572252.2012.626690>
- Moreno, R., & Mayer, R. E. (2000). A learner-centered approach to multimedia explanations: Deriving instructional design principles from cognitive theory. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 2. <http://imej.wfu.edu/articles/2000/2/05/index.asp>
- New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66, 60-92. <https://doi.org/10.17763/haer.66.1.17370n67v22j16ou>
- Odell, L., & Goswami, D. (Eds.). (1985). *Writing in nonacademic settings*. Guilford
- Quintilian. (1922). *Institutio oratoria* (H. E. Butler, Trans.). Loeb Classical Library.
- Remley, D. (2015). *How the brain processes multimodal technical instructions*. Baywood. <https://doi.org/10.4324/9781315231556>
- Remley, D. (2017). *The neuroscience of multimodal persuasive messages: Persuading the brain*. Routledge. <https://doi.org/10.4324/9781315206325>
- Robinson, J. (2016). Look before you lead: Seeing virtual teams through the lens of games. *Technical Communication Quarterly*, 25(3), 178-190. <https://doi.org/10.1080/10572252.2016.1185159>
- Rice, R., & Papper, C. C. (2005). Moving beyond text-only pedagogy: Oral, print and electronic media in technical communication assignments. In C. Lipson & M. Day (Eds.), *Technical communication and the World Wide Web* (pp. 295-304). Lawrence Erlbaum.
- Schnotz, W. (2005). An integrated model of text and picture comprehension. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 49-60). Cambridge University Press. <https://doi.org/10.1017/CBO9780511816819.005>
- Takayoshi, P., & Selfe, C. (2007). Thinking about multimodality. In C. Selfe (Ed.), *Multimodal composition: Resources for teachers*. (pp. 1-12). Hampton Press.
- Teston, C., Previde, B., & Hashlamon, Y. (2019). The grind of multimodal work in professional writing pedagogies. *Computers and Composition*, 52, 195-209. <https://doi.org/10.1016/j.compcom.2019.01.007>
- Tufte, E. (2003). *The cognitive style of PowerPoint*. Graphics Press.
- Vie, S. (2008). Tech writing, meet *Tomb Raider*: Video and computer games in the technical communication classroom. *E-Learning*, 5(2), 157-166. <https://doi.org/10.2304/elea.2008.5.2.157>

Zimmerman, M., & Marsh, H. (1989). Storyboarding and industrial proposal: A case study of teaching and producing writing. In C. B. Matalene (Ed.), *Worlds of writing: Teaching and learning discourse communities of the work* (pp. 203-221). Random House.