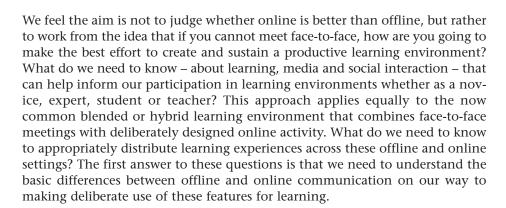# 1

# The New Media

## Introduction

The new media – from email to blogs to YouTube to Twitter – have driven major changes in who we communicate with, from where, and when. Similarly, they are driving changes in what we can and want to do in the online and on-campus classroom, and when searching and learning via the web. The differences and affordances of each of these modes of communication underpin the revolution in e-learning. Thus, it is well worth reviewing some of the fundamental differences between communicating via computer media and communicating face-to-face. This serves as a starting point for understanding what makes e-learning different from face-to-face learning.

We use computer media so frequently and in such an integrated manner with daily life that it is no longer practical to talk about computer-mediated communication (CMC) *versus* face-to-face communication. Yet, there are major differences between face-to-face and online communication, such as the text interface and asynchronous communication. Awareness and attention to these differences helps in understanding how these technologies can best be used, or adjusted for use, for e-learning. Also important is unbundling the medium from the desired outcome. For example, often people feel that in a move from face-to-face to CMC, they lose the richness of the intimate circle of others. But if we unbundle the intimate circle from the medium, we may find that what is lost is the immediacy of interaction and the close attention of others. The desired outcome of 'immediacy' and 'attention' can then be addressed with social or technical enhancements, for example more rapid feedback in asynchronous discussions or a synchronous connection with a critical mass of remote learners. In looking at CMC 'versus' face-to-face communication, there may be some losses, but there are also gains. Many studies and many successful online programs and collaborations indicate that learning and working together online and through computer media can be a satisfying and productive experience. Our task is to find out how best to make that happen.

We feel the aim is not to judge whether online is better than offline, but rather to work from the idea that if you cannot meet face-to-face, how are you going to make the best effort to create and sustain a productive learning environment? What do we need to know – about learning, media and social interaction – that can help inform our participation in learning environments whether as a novice, expert, student or teacher? This approach applies equally to the now common blended or hybrid learning environment that combines face-to-face meetings with deliberately designed online activity. What do we need to know to appropriately distribute learning experiences across these offline and online settings? The first answer to these questions is that we need to understand the basic differences between offline and online communication on our way to making deliberate use of these features for learning.

## Features of Computer-mediated Communication

The earliest observers of CMC noted that computer media convey far fewer communication cues between speaker and audience than face-to-face communication (e.g. Kiesler, 1997; Kiesler and Sproull, 1987; Sproull and Kiesler, 1986; Walther, 1996). Email lists, for example, permit communication via text from an unseen speaker to an unseen audience of indeterminate size and composition. Email – and many forms of CMC that follow – hide visible signs of gender, race and age, prevent us from picking up cues associated with how people dress, and remove from the communication a range of nuances normally added through voice, hand gesture and body language. Unless explicitly stated in messages, the status and provenance of the speaker are also invisible. At first this all seems a terrible loss, particularly if you are the person losing status by the inability to be seen. But, this status flattening has had positive effects for those who are shy about responding, or were previously prevented or inhibited from contributing because of low work status.

A key aspect – even a benefit – of CMC is the way it allows unbundling of the message from cues which are tightly bound with face-to-face communication, in particular cues about individual identity and setting. Along with unbundling, CMC can also be combined and used in ways that allow a rebundling that suits the new setting (Haythornthwaite and Nielsen, 2006). This is a particularly salient point for addressing issues of shyness, turn-taking, or remote participation in e-learning settings. While it is possible to try to re-introduce all the cues of a face-to-face setting, for example through multiple video feeds from different sites, a rush to recreate the many cues can lose the benefits that a lean, text-based, asynchronous setting confers. Such benefits include the ability to post simultaneously, to post after reflection, and to form thoughts into text, a prime communication mode in learning and education.

Both face-to-face and CMC *afford* different possibilities for communication, but both have their merits for communication outcomes. Face-to-face communication in small groups permits a richness of communications cues that provide

multiple types of information about others; lean CMC permits selective presentation of cues, providing control over what kinds of information are conveyed to others. Anonymity – or the relative anonymity possible when so many cues about an individual are missing – is one of a number of *affordances* of CMC. Box 1.1 provides background on the idea of affordances. Other major affordances of CMC are listed in Table 1.1, highlighting those that differ from the affordances of face-to-face communication. These include anonymity, but also the way CMC affords asynchronous (anytime), mobile (anywhere) communication that potentially connects widely to other people (anyone), both locally and globally. New forms of data capture, such as digital cameras, and of communication, such as blogs and blog comments, afford rapid updating and aggregation of information.

Affordances of CMC technologies – whether email, bulletin boards, wikis, chat or video – create opportunities for conversation, learning and the creation of common understanding and purpose, just as face-to-face conversation can and does. Yet, the conditions are different. Awareness of differences and possibilities helps in planning their adoption and use, as well as in recognizing where changes are happening outside the traditional learning setting that will affect supposedly 'closed-room' learning (e.g. as laptops enter the classroom). The following sections discuss some of the ways that features listed in Table 1.1 can be considered for their effect on interaction in learning contexts.

## BOX 1.1: AFFORDANCES

The idea of affordances stems from the work of Gibson (1979) referring to what an environment affords an animal in that context. This idea was adapted for discussion of design of material artifacts by Norman (1988), and for computing technology by Gaver (1991, 1996). It has also been extended to design that considers patterns of social interaction in the idea of *social affordances* proposed by Bradner, Kellogg and Erickson (1999; see also Wellman, et al., 2003). Each of these writers addresses the latent potential of the object of interest (environment, artifact, interface) for the actor approaching the object. While there is some distinction among them on how much an actor needs to be aware of the potential dangers and/or use, considering what an object allows or makes possible is useful for many areas of endeavor. Thus, we can think about the way social networking *affords* interaction among distributed participants, but also affords transmission of computer viruses and loss of privacy. The idea of affordances is particularly useful as a way to approach design and is well used in this area for computer systems design (for a critique of the use of the concept with reference to technology and learning, see Oliver, 2005a). In some cases this is taken at the very close level of what a computer screen feature allows: radio buttons afford clicking; windows allow separation of application uses; scroll bars afford navigation within a window. Attending to affordances can also be used to focus on the capabilities of a system rather than the particular instantiation of its use: the way a system

allows remote connection, asynchronous communication, data collection, navigation, awareness of others, etc. While systems may afford certain features, it is often not until a combination of social and technical features align that a particular affordance reaches its potential. Chapter 7 goes into more depth on this sociotechnical perspective.

**Table 1.1**  Major Features of Computer-mediated Communication

| Feature | Computer-mediated Communication |
| --- | --- |
| Anonymous | Relative or actual anonymity is possible because participants are only identified through an online name, email address, or personally chosen identifier. The lack of visual and contextual cues afforded by remote, online, text-only communication allows speakers to choose what they reveal about themselves. Anonymity also holds in online worlds, where individuals can choose what image of themselves they want to present in an avatar. |
| Asynchronous (Anytime) | Since communications are stored on a server for retrieval at the convenience of the recipient(s), speaker and audience do not need to be present at the same time, in the same place. This permits communication in parallel with other activities, and conversations that can spread over longer periods of time than face-to-face interaction. It also permits communication at any time of the day or night, across time zones, and across work, home or school settings; and affords simultaneous contribution, eliminating the turn-taking found in single-speaker settings and technologies. |
| Mobile (Anywhere) | Rapidly spreading communication infrastructures and shrinking mobile devices make anywhere communication a reality, allowing people to keep in touch and to follow and contribute to ongoing activities from multiple locations. Internet connectivity also puts the resources of the web in the hands of individuals at all times, from the resources of wikis to electronic journals and books. |
| Connected (Anyone) | A critical mass of online resources, in the form of web pages, digital libraries, online news and blogs, is permitting increasing access to online information. Similarly, the increasing presence of online profiles, maintained in the form of at least an email address, but also elaborated through home pages, social networking sites, diary blogs and flickr photo accounts, provides the ability to find many people and to initiate connections worldwide. |
| Rapid | Although opening and reading email or web pages may be deferred until convenient by the recipient, publication of data and information online can be accelerated where gatekeeping of publication review, and requirements of computer format and device are removed. The current mélange of CMC technologies – from mobile phone to Internet to search engine to laptop retrieval – provide quicker submission, publication and commentary on new information. |

*(Continued)*

**Table 1.1**   (Continued)

| Feature | Computer-mediated Communication |
| --- | --- |
| Global | A critical mass of users combined with ready access to technologies and infrastructure stretches contributions and retrieval well beyond national borders. Devices complementary to computers, such as mobile phones, are helping to make connection in regions where other infrastructures and devices are unavailable. |
| Text-based | While new technologies are rapidly appearing that provide easy audio and video capture and integration, our major communications online continue to be text-based, whether via email, bulletin boards, wikis or twitter. This creates a major transition as the many cues present in face-to-face communications are reduced to those chosen to be conveyed through text. |
| Persistent | Supporting asynchronous communication necessarily means storing messages for later retrieval. Discarding a message becomes a choice made separately by message senders *and* receivers, with a record of the message also inhabiting a place on computer servers and backups from where it may also be retrievable long after deleted by both message participants. How long a message persists is bound up in the habits of individuals and the intentions of system designers. This has had a profound effect on conversations, which become retainable and reviewable (email, listservs, discussion boards, online communities), putting such communications somewhere between text and speech. Similarly, posting content online (web page, blog, links to documents) puts such communications somewhere between correspondence and publication. |
| Serial, Pooled or Composite Logic | Most CMC supports serial posting of messages (email, discussion lists, blogs, blog commentaries, twitter) as its *logic of representation*. Yet the web as a whole supports a pooled interdependence, with each page contributing independently to the whole. Wiki contributions create a third kind of logic, with the visible entry as a composite, no longer obviously attributable to any particular individual. |
| Multimodal | While *media* support different platforms for communication (e.g. a text may be provided as a printout, a bound book, an editable word processing file, a fixed document file (pdf), or as a picture), *modes* support different means of expression (verbal, iconic, visual). Contemporary computing interfaces are inherently multimodal, from the texts that appear on screens to pictures, icons, menus, etc. |

## Anonymity

Anonymity can be highly important for gaining contributions from people who are not comfortable with participating, whether from shyness, lack of familiarity with ways of contributing, second language use, or concerns about how they will be judged for their submission. Thus, anonymity may be a good way to begin online contribution among new e-learners. However, longer term, it becomes important to trust what is happening to freely submitted ideas and

information, and thus to get to know others in the learning group. Face-to-face, physical cues such as gaze and body language help confirm the spoken message, helping to build trust between people. Since these are lacking when only CMC is used, other means of building trust need to be established. Identifying others is a first step, and that can be done by knowing who is talking (see Case 1.1). This provides continuity in identity over time as conversations continue and allow participants to build a mental model of the people with whom they are interacting. Even if not using a real name, continuity in identity at least creates a known history within the group and helps participants know who is talking. Sharing a history provides a common ground that can reduce the amount of joint work needed to facilitate discussion (Clark and Brennan, 1991). Over time, individuals gain reputations as experts, information providers, information gatekeepers, and synthesizers of knowledge (Montague, 2006; Preston, 2008; see also Haythornthwaite, 2006a, 2006b). When we recognize that certain group members hold specific skills or knowledge it becomes easier to know what to do with information or information requests and for the group as a whole to operate effectively (Haythornthwaite, 2006a; Wegner, 1987; for more on this, see Chapter 9).

## CASE 1.1: PLEASE POST YOUR STORY!

### Christie Koontz, Florida State University, USA

Each semester I ask the students in my online classes to write a mini-biography and post it along with a photo during the first week. The bio includes their name and professional background, where they are physically located (and hence where they are coming in from for the distance class), favorite web links expressing personal and professional interests, and career goals. Then, in that first week, I write each one an email in response and welcome them to the class, mentioning something they shared with me, so they know my response is not canned. In the next class, I allow time for students to peruse these bios and post a response to at least one. This activity introduces students to each other, some of whom may be in the same town. Privacy issues do not allow us to post who is where, so this activity provides a mechanism to facilitate a personal touch in several directions. My online mentor, a fellow faculty member at Florida State, introduced this activity to me. I share it with new faculty who observe my classes as a really successful online technique. I teach marketing, storytelling, management, foundations and supervise internships and it works well for all these classes.

**Christie Koontz** is a faculty member in the School of Library and Information Studies, Florida State University, USA.

## Asynchronous, Mobile and Connected

Asynchronicity sets the stage for anywhere, anytime, and anyone communication. It removes the necessity for all participants to be in the same physical or online meeting place at the same time. Thus, it is an ideal solution for distributed, on-the-go learners. It fits well with our contemporary, cluttered schedules which are filled with work, family and social obligations. It also serves ubiquitous learning well since it can be managed on a just-in-time and as-time-is-available schedule: formal learners can choose when to dip into and join online class discussions; lifelong learners can pick up new information and skills as and when needed; and everyday learners can search the web now for information on today's activity.
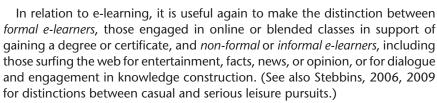
In discussing media affordances, we should note in the context of e-learning that asynchronicity and distributed participation – in time or location – are not just the purview of structured classes, nor only of online classes. Those who attend traditional classes may manage out of class tasks asynchronously through computer media, for example in the management of group projects. Similarly, online classes may meet synchronously, through chat, audioconference or videoconference. What is of interest is the way the uses of these technologies, individually or collectively, create opportunities for communication and interaction.

---

### BOX 1.2: DESCRIBING LEARNERS

Basic distinctions between *formal* and *informal* learning already exist in the literature. The *formal learner* follows their study in the context of degree or certificate-granting institutions (e.g. schools, colleges and universities). Once 'formal' describes the space, 'informal learning' becomes what's left. It is marked by a lack of the specific teacher–student relationship, but may retain a hierarchical aspect: parent–child, supervisor–employee, master–apprentice, expert–novice, guru–newbie. It can entail learning of a serendipitous nature that happens without an agenda; it can mean self-directed learning to personal goals, hence with an agenda but not one set by a teaching authority; and it often refers to acquiring process (how-to) knowledge rather than content (know-what) knowledge. Thus, the *informal learner* is found engaged in many kinds of activities. (For more on informal learning and education, see the online resource, The Encyclopedia of Informal Education at http://www.infed.org/). Building on definitions from the UK Department for Education (DfE), Garnett and Ecclesfield (2009) make a distinction between formal, informal, and *non-formal* learning, with the latter as structured learning without formal learning outcomes. These authors model the relationships between these types of learning to pursue the idea of *learner-generated contexts* (Luckin, 2010; Luckin et al., 2007, 2009; see also Chapters 3 and 7).

---

In relation to e-learning, it is useful again to make the distinction between *formal e-learners*, those engaged in online or blended classes in support of gaining a degree or certificate, and *non-formal* or *informal e-learners*, including those surfing the web for entertainment, facts, news, or opinion, or for dialogue and engagement in knowledge construction. (See also Stebbins, 2006, 2009 for distinctions between casual and serious leisure pursuits.)

We might go further and suggest that web surfers may be 'serendipitous e-learners' – browsing the net in the way many browse book shelves in the traditional library, not sure of what they will find, but ready to follow an interesting thread. Along with lifelong learners, we might add a class of 'everyday e-learners' who surf the web for answers to today's questions, a group that might formerly have looked at an encyclopedia. Finally, we might consider 'salon e-learners' who join online communities to discuss the latest arts, news or events, and 'coterie e-learners' who share their creative products with others (e.g. see Rebaza, 2009, regarding such activity in *LiveJournal*). As a whole, we might call the phenomenon of learning anywhere, anytime, from anyone, *ubiquitous learning*, and those engaged in a continual immersion of knowledge seeking, retrieval, integration and creation as *ubiquitous learners* (Cope and Kalantzis, 2009; see Chapter 9).

While we are now getting very used to online communication, and developing new personal routines to deal with keeping up with our email, twitter stream, online news reading, and social networking, asynchronicity introduces a new time management challenge for those learning or working online. It generates an extra time management load as individuals juggle the multiple worlds that put demands on their time. Anytime connectivity brings work into home hours, and formal learning into work hours. The relative invisibility of this work – for example, that the student does not leave the house or workplace and go to class – can fail to convey to others that the learner is 'in class' and occupied. The task of managing expectations across these overlapping, multiple, invisible worlds adds to what it means to be an online learner (Kazmer and Haythornthwaite, 2001; Star and Strauss, 1999). This aspect of e-learning life is discussed further in Chapter 8 on e-learning ecologies.

A major side-effect of asynchronicity for learning is the delay between post and response, question and answer. The immediacy of interaction in a face-to-face setting, combined with the multiple cues of facial expression, vocal tone, and body language, as well as the ability to use impromptu drawings or models, can allow quicker feedback on ideas and questions and more elaboration on the way to creating common understanding. While new technologies can address these limitations, for example with tablet PCs for drawing, computer simulation models, or video presentations, it is often the social solution that addresses these shortcomings. Communication practices can increase responsiveness: teachers and learners can check for questions and answers more frequently; care can be

taken in explaining; and workarounds can be developed for conveying models and drawings. Mobile infrastructures help in increasing connectivity, but it is the social pattern that adjusts – for better or worse in terms of time use – to create a responsive learning environment (see also Chapter 7 for more on synergies between social practice and technical features).

Since many teachers find the load of responding individually to each and every question and post online very demanding, the practice of collaborative learning has been taken up as one way out of this potentially show-stopping overload. Collaborative learning, and its online version computer-supported collaborative learning (CSCL; Koschmann, 1996; Koschmann et al., 2002; Miyake, 2007), involves a shift of control from delivery of knowledge by a teacher to shared evaluation and contribution from all learners. This is discussed further in Chapter 5 on participatory culture.
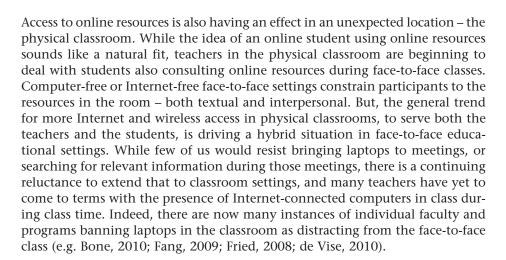
### Rapid and Global

Computer-mediated and asynchronous communication increase opportunities for interaction and learning, and thus the rapidity of input and feedback. Rapidly spreading communication infrastructures – Internet access and wireless connections – and shrinking mobile devices – laptops and smart phones – make anywhere communication a reality. People can stay aware of others' activities through twitter feeds and social networking site information; they can stay connected on tasks with mobile email; and they can update data and status information to central sites for others to view and use. All this is possible from multiple locations, and thus can bring experiences and information from individuals across town or across the world. Perhaps the most well-known examples of this kind of contribution are the mobile phone images uploaded to the web following disasters such as the Asian Tsunami (December, 2004), Hurricane Katrina in New Orleans, Louisiana (August, 2005), and the bombing attacks in London (July, 2005); and photo and twitter feeds during political demonstrations in Iran (2009; dubbed a 'twitter revolution' by the *Washington Post*, 2009; see also Smartmobs, 2009).

As well as supporting in-group communication, Internet connectivity also puts a vast range of rapidly updated online resources in the hands of individuals at all times. Web pages, online databases, digital libraries, online news, news blogs, and other online texts represent just a few of the kinds of resources that can be accessed for information retrieval. Combined with search engines and other information retrieval mechanisms, these resources greatly enhance the range of resources available at our fingertips anytime, anywhere. Of course, many of these resources are not the peer-reviewed and publisher-approved articles and books that teachers would like students to use. Widespread use of online information is becoming such a reality for all learners that the evaluation of such resources becomes a skill for today's learners to master, and for today's teachers to integrate into their practices (e.g. see Tripp, 2009).

Access to online resources is also having an effect in an unexpected location – the physical classroom. While the idea of an online student using online resources sounds like a natural fit, teachers in the physical classroom are beginning to deal with students also consulting online resources during face-to-face classes. Computer-free or Internet-free face-to-face settings constrain participants to the resources in the room – both textual and interpersonal. But, the general trend for more Internet and wireless access in physical classrooms, to serve both the teachers and the students, is driving a hybrid situation in face-to-face educational settings. While few of us would resist bringing laptops to meetings, or searching for relevant information during those meetings, there is a continuing reluctance to extend that to classroom settings, and many teachers have yet to come to terms with the presence of Internet-connected computers in class during class time. Indeed, there are now many instances of individual faculty and programs banning laptops in the classroom as distracting from the face-to-face class (e.g. Bone, 2010; Fang, 2009; Fried, 2008; de Vise, 2010).

### Text-based

Our heavily text-based communication represents a major transition from the oral and visual stimulations of a classroom or co-located setting. Missing from text are nuances in voice such as deliberate or unconscious variation in vocal pitch, pace, volume, accent, etc.; hand-gestures, eye gaze and body language; and visual cues of age, dress and race. Gone is the information on in-group interaction that can be gleaned from seating arrangement and positioning in group settings, and observation of side-conversations and attention.

The lack of these cues can be useful in the same way anonymity is useful – allowing individuals to be judged based on what they type rather than on other aspects of their person. But, many find the text-based environment too lean to maintain the kind of interpersonal connectivity they desire. They find it easy to fade back and become invisible online, and without extra effort it can be difficult to feel present or be perceived to be present online (Bregman and Haythornthwaite, 2003; Haythornthwaite and Kazmer, 2004a; Haythornthwaite et al., 2000).

Many kinds of cues have been re-introduced in daily CMC use, from emoticons to signature lines and personal icons that add nuance to a message and status to an identity. These can be used deliberately in e-learning to enhance the sense of others in the community and to introduce a greater range of interaction via text. Personality can be expressed through profile pages with personal details (see Case 1.1). Signatures, shorthands, and personal online writing styles can be developed that convey personal identity through the medium of text and the creativity afforded by keyboard characters. Online class texts may introduce variety by bringing in styles from other media, for example commands from online chat or games, or short message text, to dramatize a point or make a joke. A teacher may need to model a lighter tone in text to promote conversation

and/or a 'heavier' tone if the discussions get too much off topic. Teachers and students can work toward adopting common use of terms or styles, both those associated with the course content or career and those specific to the particular class. Common use signals solidarity with other members in an online community, and can reinforce group cohesiveness toward their joint learning goal.

## Persistent

Another feature that proves useful for learning is that CMC provides a ready-made transcript of communications that can be reviewed and reused, a *persistent conversation* (Erickson, 1999) that can be revisited, reviewed, and (in some cases) revised (see also Chapter 5). The persistent record facilitates asynchronous participation but with synchronous awareness of the discussion, that is, a learner can enter anytime and catch up on the conversation before responding. Such transcripts may be openly available online from lists with open archives or gated and accessible only to registered participants, as in environments open only to those invited or granted access because of enrollment in classes.

Knowing the record is persistent can make some participants shy about writing online and adding to ongoing information streams (Haythornthwaite et al., 2000). This may particularly be the case when teachers use the persistent text to evaluate contributions to classes. Ephemeral face-to-face conversations disappear, providing a freer environment for impromptu conversation, trying out ideas, and fooling around. Again, teachers can make a choice about such conversational features, manipulating the use of CMC to recreate ephemeral conversations, for example by turning off recording and archiving for some forums, or reducing the evaluation burden on early contributions (see Case 1.2).

---

### 📁 CASE 1.2: 'LOW STAKES' MEDIA USE

#### Lisa M. Tripp, Florida State University, USA

This online class in 'Digital Media: Concepts and Production' is designed for novices in Web 2.0 and digital media authoring. To get these students started in a non-threatening way, the first strategy used is to get students active in the learning space.

'For the first eight weeks of the class, students do "low stakes" media production exercises each week. These exercises are graded pass/fail; submitting an exercise constitutes a passing grade. This is done so as to lower students' stress levels about being assessed in an unfamiliar area, and encourage students to learn something new with little risk of failure. The exercises require minimal preproduction planning and move quickly; each exercise lasts approximately one week, and some weeks involve multiple exercises. This creates a fast pace right from the start, in which students get exposed to a wide variety

---

of "Web 2.0" tools and media production applications within a relatively short period of time. The exercises are also sequenced so as to move from the more basic competencies of using collaborative, web-based software for communication and collaboration among students, and for sharing and circulating media online, to the more advanced skills involved in using media production software to create simple, short image, audio, and video projects. In this way, each exercise helps scaffold the skills needed for the next, more complicated exercise; and, together, the exercises prepare students to do more creative, ambitious media production work in the second half of the class.' (Tripp, 2009: 3107).

Four strategies are recommended to support this kind of high tech, distributed class for novice learners: (1) use a 'low stakes' start-up strategy; (2) use an open source software to reach students with diverse, and often limited resources; (3) foster a culture of collaboration for peer support and assistance; and (4) teach ethical and legal practices for finding, remixing and circulating media, including creative commons licensing.

**Lisa M. Tripp** is an Assistant Professor in the School of Library and Information Studies, College of Communication and Information, Florida State University, USA. This case summarizes the strategies and recommendations presented in Tripp (2009).

Outside the domain of formal learning, attitudes to what can and should be posted online are emerging and are influencing social norms associated with the practice of online self-disclosure. Use of personal data from the persistent conversations in general online participation, for example personal disclosures on health or drug support sites, and social networking sites, are raising concerns about the future ramifications for individuals. Individuals are taking time to consider how they will enact their presentation of self online. As societal norms continue to change in reaction to online information use, new attitudes, prachies and expectations of use will enter formal learning environments as well, potentially affecting rules and norms for e-learning practices in institutional settings. (For more on changing conditions and attitudes to privacy in relation to online interaction, see the Pew Internet and American Life Project report on young adults and privacy considerations, Lenhart and Madden, 2007; for more on privacy and surveillance concerns, see also Lyon, 2007; for discussion of legal aspects of assuring student privacy in education, see Varvel et al., 2007).

## Logics of Representation
Different logical organization of communications is possible with CMC. Some media provide a primarily sequential ordering of messages, dictated by time of

arrival at a central server. This applies to email, discussion lists, blog commentaries, twitter. The delay between receiving a message and responding to it has often been referred to as a useful learning opportunity, providing time for reflection and thought, and the opportunity to compose a message with revision and without haste. However, this delay also creates confusion as messages appear to be out of sequence. A question may lead to an answer and further comment, and then another answer appears. Over time, we have become more accustomed to these visible traces of asynchronous interaction and interweaving of answers. We have, in essence, adopted another concept or mental model about the logic of message sequencing in asynchronous conversations, one that allows us to follow multiple threads of conversation in a sequential list (sometimes with help from the software design). However, sequential ordering is not the only option. For example, a quite different kind of sequencing – or logic – is involved with media such as wikis, where the visible presentation is of a single composite, and where each participant can overwrite another's copy. Adopting a wiki means adopting different ideas of the goals of online participation and can entail a learning process in making the switch from identifiable contributions in discussion to pooled result. Box 1.3 provides more on logics of representation, tying this to the way we read media according to different logics.

---

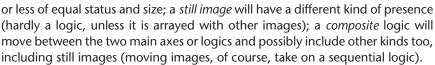## BOX 1.3: LOGICS OF REPRESENTATION

It is possible to think of the modes of communication in terms of the logics of their presentation. The conventional, print-based logic of writing (and speech) is *sequential*. That is to say, words follow other words; sentences (writing) or utterances (speech) are arranged in sequences; paragraphs follow paragraphs, and so on. Whether the writing moves vertically from top to bottom of the page (as in Chinese), or horizontally from left to right (as in English), the connecting links are sequential and we 'read' the information accordingly.

Written or spoken language, however, can embody *hierarchies* via abstraction. An idea or concept is considered to be at a 'higher' level than a fact. In science, categories and concepts are generated from observable data. *Hierarchy* assumes, then (at least in Western discourse) a more vertical logic than a sequential one. It is as if a set of smaller boxes fitted inside larger boxes. The relationship is one of larger categories embracing and including smaller ones. (While hierarchy is perhaps the most commonly known organizing principle, other kinds of relational logic are inherent in entity-relationship models used for designing relational databases, and in network models (e.g. semantic networks) that do not presuppose a higher or lower level of importance or earlier or later place in a sequence.)

These logics of sequence and hierarchy, which metaphorically can be characterized in Western discourse as horizontal and vertical, have many variations. For example, a *stack* assumes a pile of phenomena that are all more

or less of equal status and size; a *still image* will have a different kind of presence (hardly a logic, unless it is arrayed with other images); a *composite* logic will move between the two main axes or logics and possibly include other kinds too, including still images (moving images, of course, take on a sequential logic).

These logics provide us with expected ways to approach communications and to organize thought. Some media present commonly agreed upon paths for reading and production, for example reading a book from beginning to end, reading sequentially through a list of postings on a discussion list, and adding a contribution at the end of a list or the end of a thread. Some reading paths are more flexible, for example reading an image or a multimodal web page, or designing a web page. Wikis provide separate but interrelated logics of the surface level text and the behind-the-scenes talk pages.

Analysis of contemporary learning resources communicated via computer interfaces will find such logics useful. See Bayne, Williamson and Ross (2010) for an analysis of 'webquests' provided in a UK National Museums project that suggests that such logics are sometimes in conflict, to the detriment of the resource as a whole.

## Multimodal

In the main, widely adopted e-learning educational platforms depend on relatively monomodal forms of verbal language exchanges, that is, words presented in written form, whether these are conversations, explanations, reports, assignments or assessments. To some extent this can be seen as modelling the kind of discourse needed for academic work and even for much of today's business operations. However, the written form has drawbacks for many kinds of learning content where modelling, drawing, crafting, or working with objects, patients or animals is important for explaining concepts or demonstrating practice. To date, the lack of such facilities on a routine basis has led to much in the way of workarounds – pictures drawn and scanned to be sent electronically, videos of interaction as sidebars to the discussion in the class, simulations of physical processes to be run as exercises, and collaborations with off-campus sites for laboratory or field experience. However, driven by new developments in e-science, ongoing processes are more readily available to be monitored and analyzed in real time, providing continuous updating of observed processes. Greater computing power, broadband connectivity and new technologies combine to push the limits of what can be combined in the process of e-learning. Thus, virtual worlds begin to become a real possibility for reaching and engaging learners, at a distance and in real-time, in environments that make it possible to do and see and contribute in ways not previously possible in traditional learning, nor in current mainstream e-learning.

The move to such avant garde means of e-learning turns our attention to the multimodality of currently common CMC and its relation to e-learning. The very form of the screen has changed the way we read online, including at its

most basic our options about where and what to read, and in what order when web pages present framed areas of text, image, icon, video and audio, as well as conventions of menus, scroll bars and size adjustment. Reading the screen now entails choices of reading path, as well as familiarity with the common language of visual shorthands. Such shorthands serve in CMC as known conventions that compress the need to explain and negotiate understanding in the same way they do in other settings (e.g. in pidgin languages, technical languages, acronyms, metaphors, and other textual shorthands used among members of a discourse community; Clark, 1996; Clark and Brennan, 1991; Hjørland, 2004; Thagard, 2005; Lakoff and Johnson, 1980; Miller, 1994). Miller (1987) notes that icons fulfil a half-way function between words and images. The same may be said for other on-screen communicative devices such as status displays, toolbars, screen sliders and menus, each of which compresses communication and yet also, and importantly, retains our peripheral attention (e.g. as a twitter stream may flicker at the edge of attention). Beyond fixed features of text and textual compressions, still images, moving images and sound round out the common current features of the computer interface and make interaction through it more widely and more obviously multimodal.

Being conversant with the reading and writing of words, whether on paper or on screen, is what is wrapped up in the term *literacy*. However, as reading texts also becomes reading screens and multimodal communications, the term literacy becomes overly strained by the load it must bear. We pick up this discussion in Chapter 4, where we propose that as we move beyond words into other modes, that the discussion should likewise move from literacy (or even literacies) to *new discourses*.

## Conclusion

In this chapter we have looked briefly at the features of CMC that allow for the creation of a new kind of discourse space, one largely free of (or lacking) the identifying features and communication cues carried in a face-to-face setting. While a key benefit of CMC has been the unbundling of communication from face-to-face co-presence, the cues lost have left a perception of a diminished interaction. As CMC use has increased, many cues to personality, style, status and group membership have reappeared, with features rebundled to suit new settings and new purposes.

While only a few features and media combinations were discussed here, CMC is now much more than a single email channel of text-based memos. Expansion of medium and mode, and particularly their combination, create spaces as simple as a tweet and as complex as an online community supported through web space, blogs and commentaries, digital repositories, synchronous and asynchronous discussion spaces, and wiki spaces. E-learning fits anywhere and everywhere in this creative mix: on one medium or via multiple media, in an

authority-driven virtual learning environment or in an idiosyncratic user-designed mash-up of applications and communications technologies.

As new forms of CMC, alone or in combination, appear at a rapid pace, any treatise on them is unlikely to keep up. This chapter has chosen some classic features of CMC to discuss, but the major point of the chapter has been to give a proactive cast to the use of CMC, to direct attention to what a medium offers, and to advocate for use of that information to make informed choices about communication and learning environments for each e-learning experience.

## Further Reading

Andrews, R. and Haythornthwaite, C. (Eds.) (2007). *The Sage Handbook of E-learning Research*. London: Sage.

Haythornthwaite, C. and Nielsen, A. (2006). 'CMC: Revisiting conflicting results'. In J. Gackenbach (Ed.), *Psychology and the Internet*, 2nd edn. San Diego, CA: Academic Press. pp. 161–83.

Lyon, D. (2007). *Surveillance Studies: An Overview*. Cambridge, UK: Polity.

Pachler, N., Bachmair, B. and Cook, J. (2009) *Mobile Learning: Structures, Agency, Practices*. New York: Springer.

Tripp, L. M. (2009). 'Teaching digital media production in online instruction: Strategies and recommendations', in *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2009*. Chesapeake, VA: AACE. pp. 3106–11. http://www.editlib.org/p/31922